2010
URBAN WATER MANAGEMENT PLAN

Ventura County Waterworks District No. 1

Revised June 20, 2014

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ACRONYMS and ABBREVIATIONS

AB	Assembly Bill
AF	Acre Feet
AFY	Acre Feet per Year
ARRA	American Recovery and Reinvestment Act of 2009
AWPF	Advanced Water Purification Facilities
BMP	Best Management Practices
BTEX	Benzene, Toluene, Ethyl Benzene, Xlenes
Calleguas	Calleguas Municipal Water District
CALSIM	California Water Allocation and Reservoir Operations Model
CAWCD	Central Arizona Water Conservation District
CCF	Hundred Cubic Feet
CCR	Consumer Confidence Reports
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CFS	Cubic Feet Per Second
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVWD	Coachella Valley Water District
DBP	Disinfection Byproducts
D/DBP	Disinfectants and Disinfection Byproducts
District, VCWWD No. 1	Ventura County Waterworks District No. 1
DMM	Demand Management Measure
DOE	Department of Energy
DPH	Department of Public Health
DWR	Department of Water Resources
DWCV	Desert Water Agency/Coachella Valley Water District
EIR	Environmental Impact Report
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPM	Emergency Procedures Manual
ESA	Endangered Species Act
ET	Evapotranspiration
Eto	Evapotranspiration From a Standardized Grass Surface
Etr	Evapotranspiration From a Standardized Alfalfa Surface
FCGMA	Fox Canyon Groundwater Management Agency
FY	Fiscal Year
GAC	Granular Activated Carbon
GAP	Green Acres Project
GPCD	Gallons Per Capita Per Day
GPD	Gallons Per Day

ACRONYMS and ABBREVIATIONS (continued)

GPF	Gallons Per Flush
GPM, gpm	Gallons Per Minute
GMP	Groundwater Management Plan
HAAs	Haloacetic Acids
IAWP	Interim Agricultural Water Program
ICS	Intentionally Created Surplus
IID	Imperial Irrigation District
In	Inches
IRP	Integrated Resources Plan
IRWM	Integrated Regional Water Management
LARWQCB	Los Angeles Regional Water Quality Control Board
LAS	Lower Aquifer System
LRP	Local Resources Program
M&I	Municipal and Industrial
MAF	Million Acre Feet
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
MGD, mgd	Million Gallons per Day
Mg/L	Milligrams Per Liter
MIN	Minutes
MOU	Memorandum of Understanding
MPR	Master Plan Report
MTBE	Methyl Tertiary Butyl Ether
MWD	Metropolitan Water District of Southern California
MWTP	Moorpark Wastewater Treatment Plant
NDMA	N-nitrosodimethylamine
NF	Nanofiltration
ng/L	Nanogram per Liter
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OEHHA	Office of Environmental Health Hazard Assessment
PCE	Perchloroethylene
pci/L	Picocuries Per Liter
PEIR	Program Environmental Impact Report
PG&E	Pacific Gas & Electric
PHG	Public Health Goal
PPCPs	Pharmaceuticals and Personal Care Products
PVID	Palo Verde Irrigation District
QSA	Quantification Settlement Agreement
RHNA	Regional Housing Needs Assessment
RO	Reverse Osmosis
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board

ACRONYMS and ABBREVIATIONS (continued)

SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition System
SCAG	Southern California Association of Governments
SCCWRRS	Southern California Comprehensive Water Reclamation and Reuse Study
SDCWA	San Diego County Water Authority
SDWA	Safe Drinking Water Act
SDP	Seawater Desalination Program
SMP	Salinity Management Pipeline
SNWA	Southern Nevada Water Authority
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	Thousand Acre Feet
TCE	Trichloroethylene
TDS	Total Dissolved Solids
THM	Trihalomethanes
TIN	Total Inorganic Nitrogen
UAS	Upper Aquifer System
ug/L	Micrograms Per Liter
ULFT	Ultra Low Flush Toilet
USBR	U.S. Bureau of Reclamation
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compounds
WARN	Water Agencies Response Network
WEROC	Water Emergency Response Organization of Orange County
WMP	Water Master Plan
WRCC	Western Regional Climate Center
WRF	Wastewater Reclamation Facility
WRP	Wastewater Reclamation Plant
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management
WWTP	Wastewater Treatment Plant

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1 INTRODUCTION

1.1 PURPOSE AND UWMP SUMMARY

An Urban Water Management Plan (UWMP or Plan) prepared by a water purveyor is intended to ensure the appropriate level of reliability of water service sufficient to meet the needs of its various categories of customers during normal, single dry or multiple dry years. The California Water Management Planning Act of 1983 (Act), as amended, requires urban water suppliers to develop an UWMP every five years in the years ending in zero and five. Under normal circumstances, all 2010 UWMPs would have been due for submittal to the Department of Water Resources (DWR) by December 31, 2010; however, Senate Bill (SB) 7-7 (or SBX7-7) provided an additional six months to retail urban water supply agencies to allow them to conduct additional required water conservation analyses. Thus, the District's 2010 UWMP must now be adopted by July 1, 2011 and submitted to DWR within 30 days of adoption.

The legislature declared that the waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The County of Ventura Waterworks District No. 1 (District or VCWWD No. 1) 2010 UWMP Update has been prepared in compliance with the requirements of the Act, as amended to 2010[1] (Appendix A), and includes the following major subjects:

- Water Service Area
- Water, Wastewater and Recycled Water Facilities
- Water Sources and Supplies
- Water Quality Information
- Water Reliability Planning
- Water Use Provisions
- Water Supply Baselines and Conservation Targets for Compliance with 20 x 2020 (SBX 7-7 Compliance)
- Water Demand Management Measures
- Water Shortage Contingency Plan
- Water Recycling

[1] California Water Code, Division 6, Part 2.6; §10610, et. seq. Established by Assembly Bill 797 (1983).

1.2 UWMP UPDATE PREPARATION

This 2010 UWMP, prepared by Psomas and District staff, revises and updates for new requirements the 2005 UWMP prepared by Kennedy/Jenks Consultants for the District. It incorporates changes enacted by recent legislation including SB 1087 (2005), AB 1376 (2007), AB 1465 (2010), and SBX7-7 (2010). A brief summary of each of these legislative changes, as well as other related legislative changes, follows:

- SB 1087 (2005) – Requires retail water suppliers to include single family and multiple family projections for lower income and affordable households in their UWMPs. This legislation is intended to assist the water agencies in complying with the requirements Government Code Section 65589.7, which requires water suppliers to grant a priority for provision of service to housing units affordable to lower income households.
- AB 1376 (2007) – Requires each urban water supplier to notify the Planning Department of any City or County within which the supplier provides water with at least 60 days prior notice that the supplier will be reviewing the plan and considering amendments or changes to it.
- AB 1465 (2010) – Clarifies that urban water suppliers that are members of the California Urban Water Conservation Council (CUWCC) and comply with the provisions of the "*Memorandum of Understanding Regarding Urban Water Conservation in California*"[2] dated December 10, 2008, as it may be amended (MOU), may submit their annual reports required under the CUWCC MOU as evidence of compliance without the need for any additional documentation in their UWMPs.
- SBX7-7 (2010) – Requires urban water suppliers to include the following information in their 2010 UWMPs with respect to a targeted 20 percent water conservation reduction by 2020: (1) baseline daily per capita use; (2) urban water use target; (3) interim water use target; and (4) compliance daily per capita water use, including technical bases and supporting data for those determinations.
- SBX7-7 (2010) – Extends the deadline for adoption of urban retail water suppliers 2010 UWMPs until July 1, 2011, to provide sufficient time to prepare the additional required water conservation analyses described in the previous bullet.

Other legislation, which does not directly impact UWMPs, but affects eligibility for grants and loans, includes:

- AB 1420 (2007) – This legislation contains several provisions relating to urban water management plans, including:

[2] The *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) was adopted in September 1991 by a large number of water suppliers, public advocacy organizations and other interested groups and most recently amended on December 10, 2008. The MOU created the *California Urban Water Conservation Council* and established 16 Best Management Practices (BMPs) for urban water conservation, recently refined to 14 BMPs.

- Conditions eligibility for State grant and loan funding to an urban water supplier awarded or administered by DWR, the State Water Resources Control Board, or California Bay-Delta Authority or its successor agency on the following factors: (1) the implementation of water demand management measures, including the extent of compliance with conservation measures described in the previously referenced "*Memorandum of Understanding Regarding Urban Water Conservation in California*."
- Requires DWR, in consultation with the State Water Resources Control Board and the California Bay-Delta Authority or its successor agency, to develop eligibility requirements to implement the foregoing grant and loan conditions.
- Requires DWR, in consultation with the CUWCC, to convene a technical panel no later than January 1, 2009 to provide information and recommendations to the Department and the Legislature on new demand management measures, technologies and approaches. The panel and DWR must report to the legislature on their findings no later than January 1, 2010 and each five years thereafter.

- SBX3-27 (2009) – Exempts projects funded by the American Recovery and Reinvestment Act of 2009 (ARRA) from the conditions placed on state funding for water management to urban water suppliers regarding implementation of water conservation measures that were implemented under AB 1420.
- SBX7-7 – Repeals the existing grant funding conditions of AB 1420 on July 1, 2016 if they are not extended or altered prior to this date. After July 1, 2016, urban water retail water suppliers are required to be in compliance with the 20 percent by 2020 water use reduction goals to be eligible for state water management grants or loans.

The UWMP also incorporates water use efficiency efforts the District has implemented and reported in their Best Management Practices ("BMPs") pursuant to the previously referenced *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU). The District became signatory and adopted the MOU with CUWCC on July 30, 1991. Copies of the last two BMP Reports for 2007-2008 and 2009-2010 are provided in Appendix F.

The sections in this Plan correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the District's water utility.

To Assist Department of Water Resources staff in reviewing this UWMP, a copy of the DWR's suggested checklist entitled *Urban Water Management Plan Checklist, Organized by Subject*[3] is provided in Appendix B. The left hand column of the checklist

[3] Checklist provided in DWR's Final Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan, March 2011 and available on DWR website at: http://www.water.ca.gov/urbanwatermanagement/guidebook/

notes where the applicable information described to the right can be found within the body of this Plan.

Plan Adoption

The 2010 UWMP was adopted by resolution of the Ventura County Board of Supervisors on June 28, 2011 following a public hearing. The Plan was submitted to the California Department of Water Resources and the State Library within 30 days of Board approval. Copies of the Notice of Public Hearing and the Resolution of Plan Adoption are included in Appendix C. Copies of the adopted Plan were made available to the public within 30 days after the Board of Supervisor's approval and a copy provided to the City of Moorpark and County of Ventura within the same time period.

A draft copy of the Plan was posted on the District's website prior to the public hearing where it was available to the public as well as the City of Moorpark, Calleguas Municipal Water District, the Fox Canyon Groundwater Management Agency, the Metropolitan Water District of Southern California, and all other interested parties.

District Water Supply Summary

The District relies on three sources for its long-term water supply: imported treated water, local groundwater, and recycled water. A more detailed discussion of the District's water sources is contained in Section 2 of this Plan.

Imported State Water Project (SWP) water is received from the Metropolitan Water District of Southern California (Metropolitan) through Calleguas Municipal Water District (Calleguas). Imported water currently accounts for approximately three-fourths of the District's water supply. Generally, the imported water received from Calleguas has been treated at the Metropolitan Jensen Treatment Plant.

Groundwater is produced from the East Las Posas Basin (Basin). The primary land usage in the Basin consists of agriculture, except for Municipal and Industrial (M&I) uses in the City of Moorpark, which is the only significant urban land use in the District. With the exception of iron and manganese removal at two wells, the quality of the water extracted from the Basin is such that chlorination is the only treatment required to comply with Title 22 Primary Standards. The aquifer system in the Basin is the Lower Aquifer System ("LAS"), consisting of the Fox Canyon Aquifer and the Grimes Canyon Aquifer. The Fox Canyon Groundwater Management Agency ("FCGMA") was established in Ventura County by a special act of the Legislature in 1982 to control groundwater overdraft and minimize seawater intrusion in the upper and lower aquifer systems in the Oxnard Plain. FCGMA exercises management of the Basin.

Recycled water is available from the Moorpark Wastewater Treatment Plant (MWTP), owned and operated by the District. The wastewater is treated to tertiary standards for distribution and uses for landscape and agricultural irrigation.

The District is in the process of developing a brackish groundwater treatment facility (Moorpark Desalter) to treat groundwater from the South Las Posas Basin that is high in salts and total dissolved solids (TDS) to augment imported potable water supplies.

Agency Coordination

Development of the UWMP was led by the Ventura County Waterworks District No. 1 staff. District staff provided notification to the City of Moorpark and County of Ventura Planning Departments for development of the Plan and the County Clerk for the adoption of the Plan. Psomas coordinated with the City of Moorpark Planning Department for land use and population information. District staff was responsible for distribution of the Plan with assistance from Psomas.

The intent of this Plan is to focus on specific issues unique to the District's water service area. While some regional UWMP issues are introduced in this Plan, more detailed regional information is presented in Metropolitan's and Calleguas' 2010 Regional UWMPs.

To assist District staff in preparation of the District's 2010 UWMP, District staff and/or Psomas attended the following workshops facilitated by DWR and Metropolitan:

Metropolitan: 2010 UWMP Workshop held on August 18, 2010 at Metropolitan Headquarters.

DWR: Various on-line webinars held on November 30, 2010, December 16, 2010, January 5, 2011 and January 12, 2011.

DWR: 2010 UWMP Workshop at the Irvine Ranch Water District, March 8, 2011.

Table 1.2-1 lists the entities that District or Psomas coordinated with in the development of the District's 2010 UWMP. The City of Moorpark was notified of the District's public hearing for consideration of adoption of the Plan at least 60 days prior to the public hearing.

Table 1.2-1
Ventura County Waterworks District No. 1 UWMP Development Coordination and Public Involvement

Entities	Coordination and Public Involvement Actions					
	Participated in UWMP Preparation	Used Agency Data as an Information Resource	Sent and/or Available To: Copy of Draft UWMP	Commented on Draft UWMP	Sent Notice of Public Hearing	Attended Public Hearing
County Planning Department	X	X	X		X	
VCWWD No. 1	X	X	X	X		X
City of Moorpark Planning Department	X	X	X	X	X	
Calleguas		X	X		X	
Fox Canyon Groundwater Management Agency		X	X	X	X	
Metropolitan		X	X		X	
General Public			X	X	X	

The District also utilized information from the Final Calleguas Municipal Water District (Calleguas) 2010 Regional UWMP, the Metropolitan Water District of Southern California (Metropolitan) November 2010 Final Regional UWMP, and the *"Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan"* prepared by DWR in preparing the District's 2010 UWMP. This UWMP details the specifics as they relate to the District and its service area and will refer to Metropolitan, Calleguas, Fox Canyon Groundwater Management Agency and other agencies throughout. Numerous references were used in the development of this UWMP and are cited in footnotes throughout the Plan. Appendix D lists the numerous references used benefiting the development of this Plan.

The District's water supply planning considers the programs of local and regional water agencies. The County of Ventura Water and Sanitation Department staff manages and administers activities, projects and programs to optimize the District's water supply.

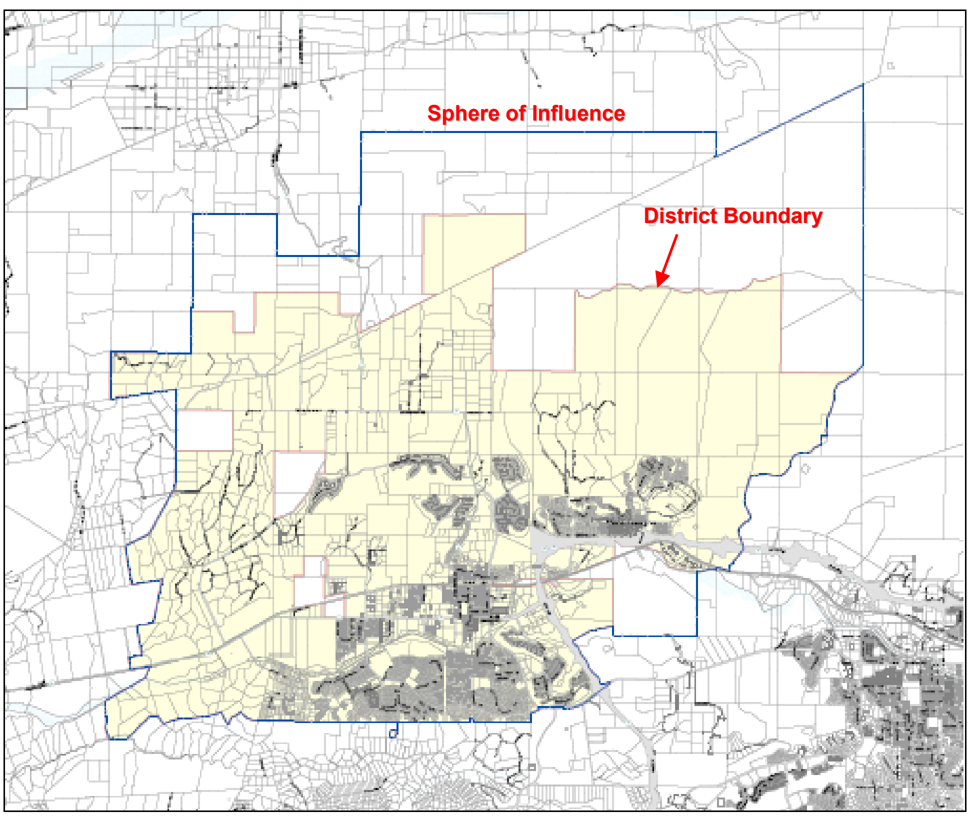
The UWMP is intended to serve as a general, flexible, and open-ended document that is updated every five years (or more often if necessary) to reflect changes in the District's water supply trends, and conservation and water use efficiency policies. This Plan, along with the District's Water Master Plan and other County planning documents, will be used by District staff to guide the water use and management efforts through the year 2015. This UWMP will require an update in 2015.

1.3 VENTURA COUNTY WATERWORKS DISTRICT NO. 1 SERVICE AREA

Location/Characteristics

The District was formed November 22, 1921, and serves approximately 38,703 residents through 10,573 service connections, including 10,401 residential and commercial service connections and 172 agricultural service connections. The District encompasses approximately 19,850 acres (31.0 square miles) and includes the City of Moorpark and contiguous unincorporated areas to the north and west. The Ventura County Board of Supervisors are the Board of Directors of the District. All proposed policy changes are reviewed by the Citizen's Advisory Committee prior to Board action. The Citizen's Advisory Committee members are appointed by the Ventura County Board of Supervisors. The District service area encompasses the City of Moorpark and surrounding portions of unincorporated lands in eastern Ventura County. The City of Moorpark is approximately five miles west of the City of Simi Valley and five miles north of the City of Thousand Oaks. A vicinity map of the District service area is shown in *Figure 1-1*.

Figure 1-1
Ventura County Waterworks District No, 1 Location Area



Climate Characteristics

The District generally encompasses the City of Moorpark and the surrounding agricultural lands in the valley area of the Arroyo Las Posas and Highway 118. This area lies between the cities of Camarillo and Thousand Oaks to the south and the Santa Clara River valley to the north. The area is characterized by "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and light to moderate rainfall. The climate for the District is consistent with coastal Southern California. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The average annual temperatures in the District service area are mild, ranging from an average high of 69.9 degrees and low of 45.3 degrees. January is usually the coldest month while July, August and September are usually the hottest months of the year. Precipitation averages 18 inches per year with most of the rain occurring in December through April. Average temperature, precipitation and evapotranspiration rate information for the District area is summarized in Table 1.3-1.

Table 1.3-1
Climate and Evapotranspiration

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
AVG. MAX TEMP (ºF)	68	69	70	74	74	78	81	82	81	78	73	69	69.9
AVG MIN TEMP (ºF)	41	42	43	46	49	53	56	57	55	50	44	41	45.3
AVG RAINFALL (in.)	4.18	4.65	3.57	0.8	0.3	0.05	0.01	0.08	0.32	0.52	1.45	2.48	18.41
STD MONTHLY Eto (in.)	2.17	2.8	4.03	5.1	5.89	6.6	7.44	6.82	5.7	4.03	2.7	1.86	55.1

Source: Rainfall and Temperatures from www.weather.com/…/USCA0728
Evapotranspiration: CIMIS Reference Evapotranspiration Zones – Zone 9 for Moorpark area

Evapotranspiration

Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indication of how much water crops, lawn, garden, and trees need for healthy growth and productivity.

Precipitation and irrigation are the two primary sources of water that plants use. Plant leaves and soil surfaces temporarily retain some part of the water applied to the soil. This part is readily available for evaporation. The remaining part infiltrates into the soil. Plants extract the infiltrated water through their roots and transport it up to their leaves for photosynthesis, a process by which plants produce glucose (sugar).

Many factors affect ET including:

- Weather parameters such as solar radiation, air temperature, relative humidity and wind speed;
- Soil factors such as soil texture, structure, density and chemistry; and
- Plant factors such as plant type, root depth, foliar density, height and stage of growth.

The California Irrigation Management Information System (CIMIS), Department of Water Resources, Office of Water Efficiency is using well-watered actively growing closely clipped grass that is completely shading the soil as a reference crop at most of its over 130 weather stations. Therefore, reference evapotranspiration is mostly referred to as ETo on the CIMIS website. The monthly average ETo data shown in Table 1.3-1 (above) has been extracted from the CIMIS website containing the Evaportranspiration Zones. The District (and the Moorpark area) are located in Zone 9.

Demographics

The population of the District's water service area is currently estimated at 38,703 residents through 10,573 total service connections, including 10,401 residential and commercial service connections and 172 agricultural service connections. A major portion of land uses in the District is municipal (residential and commercial in the City of Moorpark) with the balance comprising agricultural lands. Increases in future water demand are expected to come from development of residential and commercial customers consistent with the buildout of the City of Moorpark as shown in their General Plan.

Table 1.3-2
Ventura County Waterworks District No. 1
Water Service Area Population Projections

	2010	2015	2020	2025	2030	2035
District	38,703	40,434	43,824	45,933	46,405	46,405

Source: Existing population from DOF. Future population from SCAG projections for City of Moorpark delayed by 5 years per City of Moorpark Community Development Director, David Bobardt. All water service area populations are increased by 3 percent above City population to account for areas outside City.

1.4 VENTURA COUNTY WATERWORKS DISTRICT NO. 1 FACILITIES

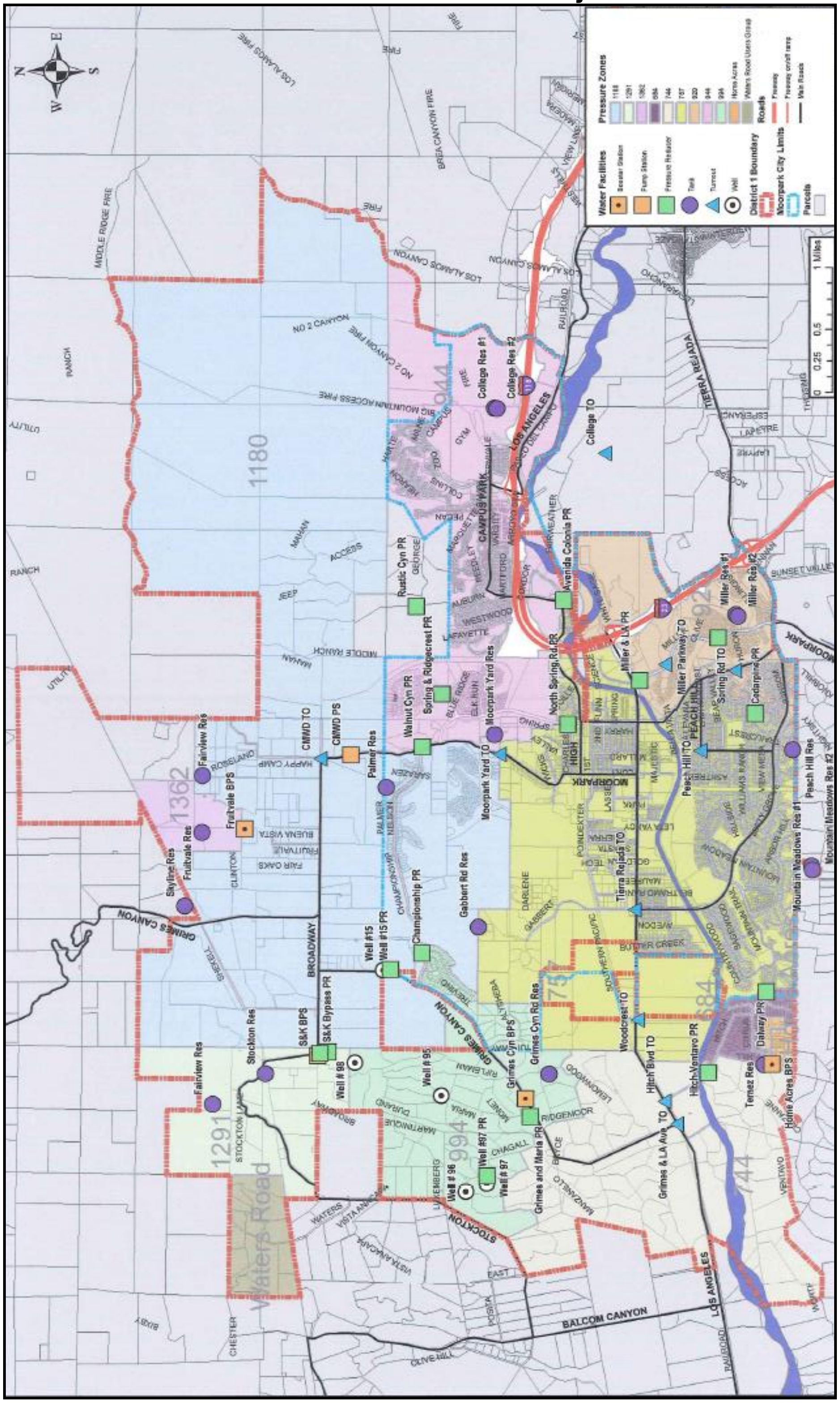
The District's water distribution system consists of 138 miles of water lines, seven pumping stations, 18 pressure reducing stations, six active production wells, nine imported water turnouts, and 18 reservoirs. In fiscal year 2010, the District supplied a total of approximately 11,714 acre-feet (AF) of water, 22% of it from local sources (including 2,165 AF of groundwater and 388 AF of recycled water) and 78% of it imported (9,161 AF). Domestic, commercial, industrial, and fire protection customers consume approximately 77% of the total water supplied. Agricultural customers consume the remaining 23%.

Local water, treated by chlorination, is supplied from six groundwater wells owned and operated by the District. Imported water comes from the State Water Project through the Metropolitan Water District (Metropolitan) and Calleguas Municipal Water District (Calleguas). Water from the State Water Project originates in northern California. This water is captured in reservoirs north of Sacramento and released through the natural rivers and streams into the Sacramento-San Joaquin Delta. The 444-mile long California Aqueduct then carries water from south of the delta to State Water Project contractors, including Metropolitan. Metropolitan treats the water at Jensen Treatment Plant located in Granada Hills. Calleguas purchases water from Metropolitan and purveys it to 26 water suppliers within Ventura County, including the District.

The District owns, operates and maintains the Moorpark Wastewater Treatment Plant (MWTP) located at 9550 Los Angeles Avenue just west of Moorpark City limits south of State Highway 118. The original MWTP was completed in 1965 as an interim treatment facility with a capacity of 1 million gallons per day (mgd). It has since undergone several upgrades, the latest of which was completed in February 2010 and increased capacity to 5 mgd. In August 2003, the District began supplying recycled water for golf course irrigation.

The District's service area and major supply and distribution facilities are shown on *Figure 1-2*. The Ventura County Waterworks District No. 1 Water System Master Plan Update dated August 2008 details the District's major facilities and is referenced for more detailed information.

Figure 1-2
VCWWD No. 1 Service Area and Major Facilities



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2 WATER SOURCES AND SUPPLIES

2.1 WATER SOURCES

The District utilizes a combination of water supplies to meet its demands. The most significant is potable water imported from Metropolitan Water District of Southern California (Metropolitan) through the local wholesale agency, Calleguas Municipal Water District (Calleguas). Local groundwater provides the next most prevalent source of water. The District also relies on recycled water for the balance of their needs. Historically, imported water has made up approximately 80 percent of the District's water supply. In times of drought or limited groundwater allocations the District must rely almost completely on imported water from Metropolitan. With improvements to their wastewater operations, recycled water has become more available to meet demands for irrigation, notably for landscape.

The District's current sources of supply are described below.

2.1.1 Imported Water

Treated potable water is imported to the District from Calleguas which, in turn, receives its water from Metropolitan.

Calleguas Municipal Water District (Calleguas)

Calleguas is an enterprise special district that was formed by the voters of southern Ventura County in 1953 for the purpose of providing a safe, reliable water supply. Named for the watershed in which it is located, Calleguas is a public agency established under the Municipal Water District Act of 1911. It is governed by a five-member board of directors elected by voters to represent each of the five geographic divisions within the District. In 1960, Calleguas became a member agency of Metropolitan, which provides wholesale water from the Colorado River via the Colorado Aqueduct and northern California via the State Water Project (SWP). Metropolitan is comprised of 26 member agencies, and Calleguas is the fifth largest member agency in terms of average annual water deliveries. *Figure 2-1* shows Calleguas' service area boundaries.

Calleguas distributes high quality drinking water on a wholesale basis to 19 local purveyors, who in turn deliver water to area residents, businesses, and agricultural customers. These purveyors are listed in Table 2.1-1 and include VCWWD No. 1 (District). Approximately three-quarters of Ventura County residents (roughly 630,000 people) depend on Calleguas for all or part of their water and the water supplied by Calleguas currently represents approximately 73 percent of the total municipal and industrial water demand within its service area. It is important to note that a large portion of the water use in Ventura County is for agricultural purposes. Agricultural demands are generally met by the District or other private entities using groundwater from various basins underlying the area.

Figure 2-1
Calleguas Municipal Water District Service Area

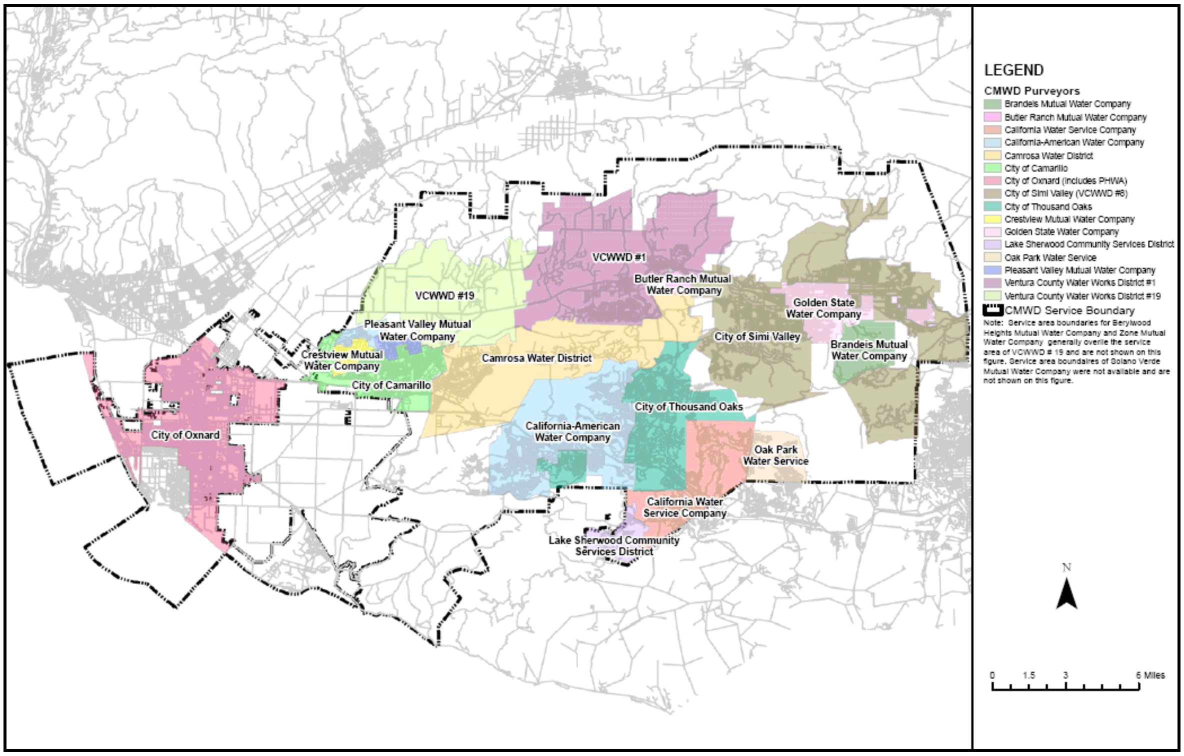


Table 2.1-1
Calleguas Purveyors

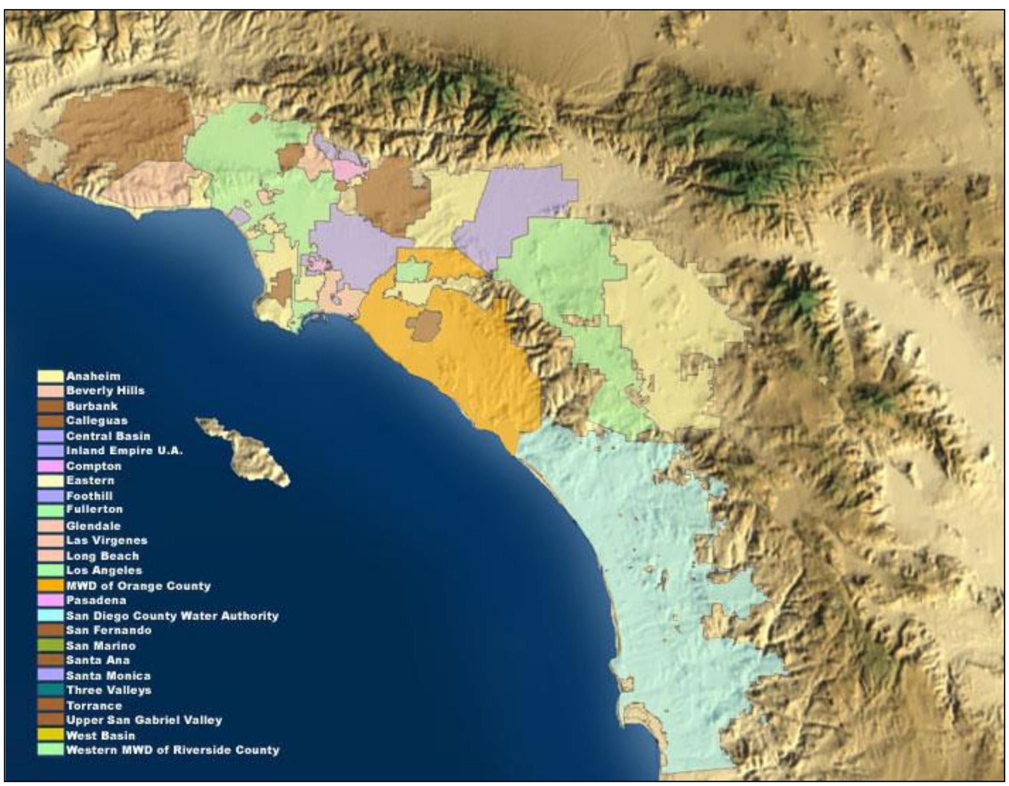
Berylwood Heights Mutual Water Company	Crestview Mutual Water Company
Brandeis Mutual Water Company	Golden State Water Company
Butler Ranch Mutual Water Company	Lake Sherwood Community Services District
California Water Service Company	Oak Park Water Service
California-American Water Company	Pleasant Valley Mutual Water Company
Camrosa Water District	Solano Verde Mutual Water Company
City of Camarillo	VCWWD No. 1
City of Oxnard	VCWWD No. 19
City of Simi Valley (VCWWD No. 8)	Zone Mutual Water Company
City of Thousand Oaks	

Metropolitan Water District of Southern California (Metropolitan)

Metropolitan was formed in the late 1920's. At that time, Ventura County was virtually all an agriculturally-based economy with the cities of Oxnard, Ventura, Santa Paula and Fillmore the only urban-style development. Some other small towns and residential communities existed at that time but they were primarily related to the agricultural business. Metropolitan was formed for the purposes of importing water from the Colorado River to the communities of Southern California. Collectively, the charter member cities and water agencies recognized the limited water supplies available within the region, and realized that continued prosperity and economic development of Southern California depended upon the acquisition and careful management of an adequate supplemental water supply. This foresight made the continued development of Southern California and Ventura County possible.

Metropolitan also acquires water from Northern California via the State Water Project (SWP). The Metropolitan development of the SWP and the Colorado River Aqueduct (CRA) supplies water to most of southern California. As a wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its 26 member agencies. One such member agency is Calleguas. Metropolitan's service area is depicted in *Figure 2-2*.

Figure 2-2
Metropolitan Water District Service Area



Source: *Service area map extracted from Metropolitan's website at:*
http://www.mwdh2o.com/mwdh2o/pages/memberag/member03.html

2.1.2 Groundwater

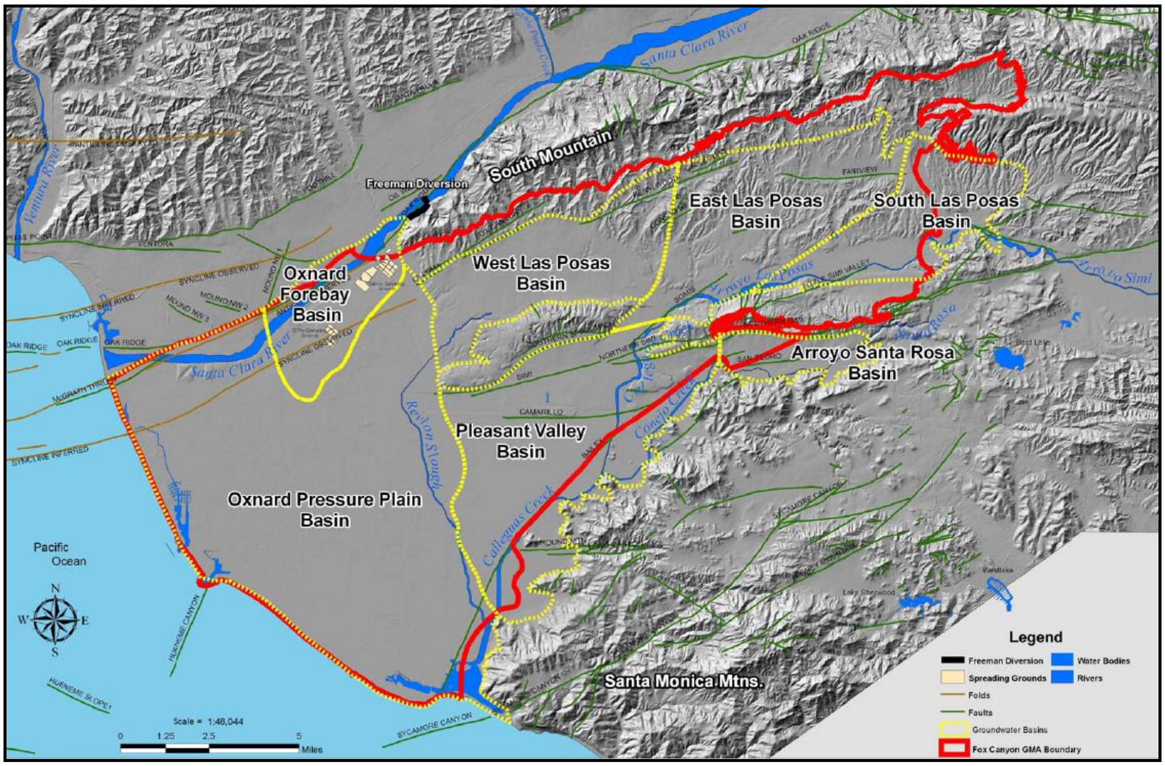
Groundwater has been used in Ventura County for many years, for agricultural irrigation and municipal and industrial water supply. The aquifer system in groundwater basin underlying the areas south of the Santa Clara River valley (the Oxnard plain and the foothill areas around Oxnard, Camarillo and Moorpark) is generally stratified into the Lower Aquifer System ("LAS"), consisting of the Fox Canyon Aquifer and the Grimes Canyon Aquifer and the Upper Aquifer System ("UAS").

Historically, the aquifer system has been in a state of overdraft, mostly in the Lower Aquifer System (LAS), which has led to seawater intrusion. The non-consumptive portion of imported water utilized by the District is treated at local wastewater treatment facilities and discharged to the Calleguas Creek watershed. This water ultimately percolates into the UAS, increasing groundwater levels in the region. Unfortunately, water in the UAS has elevated levels of chlorides and TDS. Numerous agencies are active participants in regional efforts to put some of this water to beneficial use by advancing groundwater desalter projects (groundwater recovery).

The East Las Posas Basin supplies all the local groundwater for the District. The East Las Posas Basin is 9 miles long and 4.5 miles wide with land usage consisting primarily of agriculture except in Moorpark, which is the only significant urban development in the basin. Geological investigations recently led to the discovery of a north/south fault that distinctly divides the basin. The two halves are the East Las Posas and West Las Posas Basins. The District's wells are located in the East Las Posas Basin. The Fox Canyon Groundwater Management Agency (FCGMA) boundary and basins within it are illustrated on *Figure 2-3*. A copy of the latest FCGMA Groundwater Management Plan is included as Appendix H along with pertinent FCGMA ordinances. The quality of the water in the basin is such that chlorination is the only treatment required to comply with the Title 22 Primary Standards. The primary aquifer system, the LAS, consists of the Fox Canyon Aquifer and the Grimes Canyon Aquifer. Supply is primarily through wells with yields of 1,000 to 1,500 gallons per minute (gpm). Although estimates of storage capacity vary, the North Las Posas Basin, which terminology is no longer used and generally encompasses the East and West Las Posas Basins, is generally believed to have a total storage capacity between 3,000,000 and 3,500,000 acre-feet (AF) (California Department of Water Resources, 1975 and 1953 and Calleguas, 1989). It should be noted that only a fraction of this total storage capacity is currently useable on an annual basis due to potentially significant impacts such as water quality degradation, increased pumping lifts, and subsidence.

The Las Posas Valley Groundwater Basin (DWR Basin No. 4-8), which generally includes the East Las Posas Sub-Basin, is not adjudicated and based on the DWR official departmental bulletins, California's Groundwater Bulletin 118 Updated 2003 and Bulletin 160, the California Water Plan Update 2009, the Basin is not specifically identified as a basin in an overdraft condition. However, the California Water Plan Update does state that groundwater overdraft is a challenge for the South Coast Hydrologic Region[4], which includes the Basin. FCGMA was formed primarily to manage water quality and managing extractions aids in this goal. FCGMA maintains, however, that the Las Posas Basin is in overdraft relative to the native water supply to the Basin but has been sustained in some areas by non-native inflows from wastewater treatment plant discharges, urban runoff, and shallow groundwater dewatering discharges from upstream areas. FCGMA feels that since the non-native inflows are causing widespread water quality impacts to the Basin, they may not be considered part of the Basin yield and these non-native inflows may be significantly reduced in the future as a result of recycled water re-use and/or actions to comply with State TMDL for the watershed.[5]

Figure 2-3
Fox Canyon Groundwater Management Agency and Basins



Ventura County Waterworks District No. 1 (District) Wells

Groundwater is currently produced from six wells owned and operated by the District with production varying from 500 gallons per minute (gpm) to 1,100 gpm, with an existing total system capacity of approximately 5,350 gpm as shown in Table 2.1-2.

[4] The California Water Plan Update 2009 is available on DWR's website at: http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v3_southcoast_cwp2009.pdf
[5] FCGMA, letter from Bryan Bondy to Cefe Munoz, June 8, 2011.

Table 2.1-2
Active Well Capacities

Well No.	Design Flow (gpm)	Status
15	500	Active
95	750	Active
96	1,000	Active
97	1,000	Active
98	1,000	Active
20 (Fe & Mn Trtmt)	1,100	Active
Total Active Capacity	**5,350**	
Phase 1 Desalter Wells	3,100	Planned
Total Active & Planned Capacity	**8,450**	

Note: Well 20 became operational in April 2011

Table 2.1-3 summarizes the total amount of groundwater pumped by the District and shows the breakdown by well for fiscal years 2005 through 2010.

Table 2.1-3
Amount of Groundwater Pumped by Well (AF)

Well No.	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10
15	127.9	10.7	0.0	372.7	629.3	631.9
95	59.6	66.0	148.6	420.2	271.1	275.2
96	11.6	28.2	90.0	507.8	87.1	577.1
97	35.4	20.2	60.3	147.4	614.0	373.3
98	14.1	33.7	115.3	44.9	481.3	307.6
Total	**248.6**	**158.8**	**414.2**	**1,493.0**	**2,082.8**	**2,165.1**

Table 2.1-4 shows the amount of groundwater that is projected to be pumped from the Basin in the next 25 years. The amount shows the 5,000 AFY of recovered groundwater projected to be pumped and treated through the proposed first phase of the reverse osmosis desalter project (Moorpark Desalter) commencing in 2015 and 10,000 AFY in a subsequent phase commencing in 2020. Projected imported water is shown at the bottom of Table 2.1-4 and a total supply shown for all sources, excluding recycled water. The amount and timing of the Recovered Groundwater shown in Table 2.1-4 is subject to an on-going study regarding the impacts of the project on the groundwater basin and subsequent agreement with FCGMA. If these projected volumes are not achieved, imported water would be increased to make up the difference between the amount projected and that achieved.

Table 2.1-4
Amount of Groundwater Projected to be Pumped
(Rounded to Nearest 10 AF)

Type	2015	2020	2025	2030	2035
Potable Groundwater	2,240	2,240	2,240	2,240	2,240
Recovered Groundwater	5,000	10,000	10,000	10,000	10,000
Groundwater Total	7,240	12,240	12,240	12,240	12,240
Imported	5,822	1,045	1,804	2,602	3,441
Groundwater & Imported	13,062	13,285	14,044	14,842	15,681

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3 WATER QUALITY

3.1 WATER QUALITY OF EXISTING SOURCES

As required by the Safe Drinking Water Act, which was reauthorized in 1996, the District provides annual Water Quality Reports to its customers; also known as Consumer Confidence Reports (CCR). This mandate is governed by the Environmental Protection Agency (EPA) and the California Department of Public Health (CDPH) to inform customers of their drinking water quality. In accordance with the Safe Drinking Water Act, the District monitors a number of regulated and unregulated compounds in its water supply. The results from this testing were included in the District's 2009 Annual Water Quality Report[6], a copy of which was mailed to all residents of District's water service area. As noted in that report, the District vigilantly safe-guards its water supply and, as in years past, the water delivered to District customers meets the standards required by the state and federal regulatory agencies. As mentioned earlier, the District's sources of potable water currently include imported water supplies and groundwater.

3.1.1 Imported Water

The District receives imported water through Calleguas from Metropolitan, which receives raw water from northern California through the SWP and the Colorado River Aqueduct. Metropolitan water is treated in accordance with potable standards at filtration plants located throughout Southern California. The District receives its imported water which is treated at the Joseph Jensen Filtration Plant located in Granada Hills, through its Metropolitan member agency, Calleguas, via Metropolitan's West Valley Feeder No. 2 Pipeline. Calleguas' sole connection to Metropolitan is located in the City of Chatsworth at Calleguas' East Portal Facility. From this point water is conveyed 1.4 miles through the Perliter Tunnel into Simi Valley, where it is distributed through Calleguas's transmission system, injected into the Las Posas aquifer, or stored in Lake Bard.

Water stored in Lake Bard is treated in the Lake Bard Water Treatment Plant primarily in summer months to supplement the capacity of Metropolitan for delivery to the western portion of the Calleguas service area. This treatment plant can also supply the entire Calleguas service area during short durations if service from Metropolitan is interrupted or reduced due to routine maintenance or emergencies.

Metropolitan Water District tests and treats its water for microbial, organic, inorganic, and radioactive contaminants as well as pesticides and herbicides. Protection of Metropolitan's water system continues to be a top priority. In coordination with its 26 member agencies, Metropolitan added new security measures in 2001 and continues to upgrade and refine procedures. Changes have included an increase in the number of water quality tests conducted each year (more than 300,000 tests are conducted for over

[6] The Ventura County Waterworks District No. 1 2009 Annual Water Quality Report can be viewed on the District's website at: http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/WaterSanitation/water_quality/CCR%20Dist%201%202009%20CA000591-1_WR.pdf

200 possible compounds) as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.[7] Metropolitan also has one of the most advanced laboratories in the country where water quality staff perform tests, collect data, review results, prepare reports, and research other treatment technologies. Although not required to do so, Metropolitan monitors and samples substances that are not regulated but have captured scientific and/or public interest. Metropolitan has tested for chemicals such as perchlorate, methyl tertiary butyl ether (MTBE), and chromium VI among others.

Metropolitan's October 2010 Integrated Water Resources Plan (IRP) Update[8], notes that water quality is intrinsically tied to supply reliability. Additionally, Metropolitan's 2010 Regional Urban Water Management Plan, indicates each of their major sources of water (the SWP and the CRA) has specific water quality problems. However, that Plan also notes "Metropolitan has not identified any water quality risk that cannot be mitigated."[9]

The major water quality concerns Metropolitan identified in its 2010 Regional Urban Water Management Plan include the following: (1) salinity; (2) perchlorate; (3) total organic carbon and bromide (disinfection byproduct precursors); (4) nutrients (as it relates to algal productivity); (5) arsenic; (6) uranium; (7) chromium VI; (8) N-nitrosodimethylamine (NDMA); and (9) pharmaceuticals and personal care products (PPCPs). Each of these constituents of concern, as well as one additional decreasing concern (MTBE) is addressed in further detail below.

3.1.2 Salinity

Water from the CRA has the highest level of salinity of all Metropolitan sources of supply, averaging 630 milligrams per liter (mg/L) since 1976.[10] Several actions have been taken at the state and federal level to control Colorado River salinity including (1) the International Boundary and Water Commission approval of Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River in 1973; (2) the U.S. President's approval of the Colorado River Basin Salinity Control Act in 1974 and (3) the formation of the Colorado River Basin Salinity Control Forum. In 1975, water quality standards and a plan for controlling salinity were approved by the EPA.

In contrast, water from the SWP is significantly lower in TDS, averaging 250 mg/L over the long term in water supplied through the East Branch and 325 mg/L in water supplied through the West Branch, which is the supply source for Calleguas and the District. Because of the lower salinity, Metropolitan blends SWP water with Colorado River water

[7] Per Metropolitan's 2010 Regional Urban Water Management Plan, page 4-17 which can be viewed on their website at http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf

[8] MWD's October 2010 Integrated Water Resources Update can be viewed on their website at http://www.mwdh2o.com/mwdh2o/pages/yourwater/irp/IRP2010Report.pdf

[9] Per Metropolitan's 2010 Regional Urban Water Management Plan, page 4-1 which can be viewed on their website at http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf

[10] Ibid., page 4-3

to reduce the salinity in the water delivered to its customers. Metropolitan's board has adopted a salinity objective of 500 mg/L for blended imported water as defined in Metropolitan's Salinity Management Action Plan. Metropolitan estimates that the objective can be met in seven out of ten years. In the other three years, hydrologic conditions would result in increased salinity and reduced volume of SWP supplies.

Perchlorate in the Colorado River

Perchlorate, a contaminant of concern, which can be found in rocket propellant and some types of munitions and fireworks, is believed to inhibit the thyroid's ability to process iodide and produce hormones required for normal growth and development. Perchlorate has been detected at low levels in the Colorado River water supply. It also has the ability to quickly dissolve and become mobile in groundwater. Perchlorate is difficult to remove from water supplies with conventional water treatment. Successful treatment technologies include nanofiltration, reverse osmosis, biological treatment, and fluidized bed bioreactor treatment. Metropolitan continues to monitor perchlorate contamination of the Colorado River. Perchlorate levels in the Colorado River have been declining in recent years, following installation of remedial treatment systems at industrial point source locations in the Las Vegas area beginning in 1998. These efforts have reduced perchlorate levels entering the Colorado River from Las Vegas by up to 90 percent since 1998.

As a result of the aforementioned aggressive clean-up efforts, perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from their peak of 9 micrograms per liter (μg/L) in May 1998. Since 2002, levels have remained less than 6 μg/L and have typically been less than 2 μg/L since June 2006. For comparison purposes, the California Department of Public Health (CDPH), on October 18, 2007, established a primary drinking water standard for perchlorate with a Maximum Contaminant Level (MCL) of 6 μg/L. There is currently no federal drinking water standard for perchlorate, but the USEPA is in the process of making its final regulatory determination for this contaminant[11]

In addition to the Lake Havasu site, Metropolitan also routinely monitors perchlorate at 34 locations within its system. Monitoring data from these locations reflect non-detectable levels (below 2 μg/L). Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

Total Organic Carbon and Bromide (Disinfection By-Product Precursors)

SWP water supplies contain levels of total organic carbon and bromide that are a concern to Metropolitan's objective of maintaining safe drinking water supplies. When water is disinfected at treatment plants, certain chemical reactions can occur with these impurities that can form Disinfection Byproducts (DBP). DBPs include trihalomethanes (THMs) and haloacetic Acids (HAAs). THMs and HAAs have been found to cause cancer in laboratory animals. Inherent in any through-Delta water movement is the high organic

[11] Ibid., page 4-8

and bromide loading imposed on the water from agricultural runoff and salt water intrusion. This poses significant treatment challenges to the receiving end users, like Metropolitan, when it comes to avoiding problems with DBPs and the formation of THMs. With this in mind, it is imperative that the quality of SWP water delivered to Metropolitan be maintained at the highest levels possible.

Water agencies such as Metropolitan, began complying with new regulations to protect against the risks associated with DBP exposure in January 2002. This USEPA rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required water systems to comply with new MCLs by using appropriate treatment techniques to improve control of DBPs. The USEPA then promulgated the Stage 2 D/DBP Rule in January 2006, which makes regulatory compliance more challenging because it is now determined on a locational basis, rather than on a distribution system-wide basis.

To ensure the implementation of cost-effective solutions, source water quality improvements must be combined with appropriate water treatment technologies. In addressing this requirement, Metropolitan looked first at each of its five treatment plants. Two of those (Mills and Jensen) receive SWP water exclusively, while the other three (Skinner, Weymouth and Diemer) receive a blend of SWP and Colorado River water. In 2003, 2005, and 2010, Metropolitan completed upgrades to its Mills, Jensen and Skinner water treatment plants, respectively, to utilize ozone as its primary disinfectant. This ozonation process avoids the production of certain regulated disinfection byproducts that would otherwise form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water have met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limits the percentage of water from the SWP used in each plant. Metropolitan's Board has also adopted plans to install ozonation at its other two blend plants (Weymouth and Diemer) in the coming years.

Nutrients

Increased nutrient loading (phosphorous and nitrogen compounds) can lead to the formation of algal and aquatic weed growth, noxious taste and odor compounds, algal toxins and an increase in quagga and zebra mussels and other invasive biological species. The formation or accumulation of these undesired elements has negative ramifications upon the efficiency of the water treatment and conveyance processes and inevitably leads to consumer complaints. Metropolitan has therefore taken action to minimize nutrient loading in both its SWP and CRA delivery sources as described in the following paragraphs.

Wastewater discharges, agricultural drainage and nutrient-rich soils in the California Delta all contribute to the high levels of nutrient loading entering SWP facilities. Metropolitan and other local water agencies have therefore been working with Delta area wastewater agencies in an effort to minimize these nutrient loadings. Metropolitan also has a comprehensive program to monitor and manage algae growth in its source water reservoirs. In some cases, these monitoring efforts coupled with consumer taste and odor complaints have resulted in the need to temporarily bypass some of these reservoirs, which can have a short-term impact on available water supplies.

Nutrient levels in the Colorado River are much lower than in the SWP, which allows Metropolitan to blend CRA water with SWP and thereby greatly reduce overall nutrient levels in the water supplied to its member agencies. Nevertheless, nutrient loading in the CRA system is still a concern given projected growth patterns in the Las Vegas area. For this reason, Metropolitan continues to work with entities along the Colorado River to promote good wastewater management practices which lead to reduced phosphorous and nutrient loadings.

As a result of the aforementioned monitoring and management programs, Metropolitan believes there should be no impact on future availability of water supplies due to high nutrient loadings.

Arsenic in Surface Waters

Arsenic, which has been linked to certain cancers and skin conditions, is a naturally occurring element found in rocks, soil, water, and air. Arsenic from these sources can enter the water supply through the natural erosion of rocks, as well as the dissolution of ores and minerals. Arsenic can also be found in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Agriculture and industrial discharges from these sources can contribute to elevated levels of arsenic in drinking water supplies.

The MCL for arsenic in domestic water supplies was lowered to 10 μg/L (from 50 μg/L), with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in California's regulations for both groundwater and surface water supplies. Metropolitan water supplies have historically had low levels of arsenic and have therefore not required treatment to comply with this standard. However, some of Metropolitan's water supplies are supplemented by groundwater storage programs, which in some cases have arsenic concentrations near the MCL. In general, these groundwater storage projects are used to supplement supplies only during low SWP allocation years. In some instances, Metropolitan has restricted the use of such groundwater programs, thereby limiting the introduction of arsenic into the SWP. Metropolitan has also worked with one of its groundwater banking partners in constructing a pilot arsenic treatment facility to reduce arsenic concentrations in this supply source.

In April 2004, based on reported lung and urinary bladder cancer risk data, California's Office of Environmental Health Hazard Assessment (OEHHA) set a public health goal (PHG) for arsenic of 0.004 μg/L. Monitoring results reported on CDPH's website for the period 2002-2005 showed arsenic is ubiquitous in drinking water sources, reflecting its natural occurrence. Those results also show many sources have arsenic levels above the 10 μg/L MCL (e.g., Southern California drinking water sources containing arsenic concentrations over 10 μg/L include San Bernardino (64 sources), Los Angeles (48 sources), Riverside (26 sources), Orange (4 sources), and San Diego (5 sources)).[12]

In all cases, arsenic levels detected in Metropolitan's SWP and CRA source waters and water treatment plant effluent have been below the 10 μg/L MCL. Nevertheless, the state detection level for purposes of reporting arsenic is 2 μg/L. Between 2001 and 2008, arsenic levels in Metropolitan's water treatment plant effluents ranged from not detected (< 2 μg/L) to 2.9 μg/L. For Metropolitan's source waters, levels in Colorado River water ranged from not detected to 3.5 μg/L, while levels in SWP water ranged from not detected to 4.0 μg/L.

Uranium

Uranium is a contaminant of concern in the water from the Colorado River. A 16-million ton pile of uranium mine tailings is located approximately 750 feet from the river at Moab, Utah. Rainfall seeps through this pile and contaminates the local groundwater which flows to the river. Additionally, due to the proximity of the pile to the river, there is a potential for the tailings to enter the river as the result of a catastrophic flood event or other natural disaster.

Previous investigations have shown uranium concentrations within the pile near the Moab site, at levels significantly above the California MCL of 20 picocuries per liter (pCi/L). Metropolitan has been monitoring for uranium in the Colorado River Aqueduct and at its treatment plants since 1986 and at Lake Powell since 1998. Uranium levels measured at Metropolitan's intake have ranged from 1 to 6 pCi/L, which are well below the California MCL. Conventional drinking water treatment, as employed at Metropolitan's water treatment plants, can remove low levels of uranium, however these processes would not be protective if a catastrophic event washed large volumes of tailings into the Colorado River.

The U.S. Department of Energy (DOE) is responsible for remediating the site near Moab, which includes removal and offsite disposal of the tailings and onsite groundwater remediation. Metropolitan continues to track progress of the remediation efforts, provide the necessary legislative support for rapid cleanup, and work with Congressional representatives to support increased annual appropriations for this effort. Site remedial actions conducted since 1999 have focused on removing contaminated water from the pile and from underlying groundwater. Through 2009, over 2,700 pounds of uranium has been removed from contaminated groundwater.

DOE issued its Final Environmental Impact Statement in July 2005, which recommended permanent offsite disposal by rail to a disposal cell at Crescent Junction, Utah, located approximately 30 miles northwest of the Moab site. Such rail shipments began in April 2009, with over 1 million tons of mill tailings shipped to the Crescent Junction disposal

[12] Per CDPH website: http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Arsenic.aspx - note the numbers reported on this site can change as the site is updated.

cell through March 2010. DOE anticipates shipment of an additional two million tons of tailings by September 2011 with complete removal by 2025.

Another uranium-related issue, which could negatively impact CRA water supplies, began receiving attention in 2008 as a result of renewed worldwide interest in nuclear energy and the associated increase in uranium mining claims filed throughout the western United States. Of particular interest to Metropolitan were thousands of mining claims filed near Grand Canyon National Park and the Colorado River watershed. Metropolitan has since sent letters to the U.S. Secretary of Interior to highlight source water protection and consumer confidence concerns related to uranium exploration and mining activities near the Colorado River, and advocate for close federal oversight over these activities. In 2009, Secretary of Interior Ken Salazar announced a two-year hold on new mining claims on one million acres adjacent to the Grand Canyon to allow necessary scientific studies and environmental analyses to be conducted. In 2009, H.R. 644, the Grand Canyon Watersheds Protection Act was introduced and if enacted, would permanently withdraw areas around the Grand Canyon from new mining activities.

Chromium VI

Like arsenic, chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium III is typically the form found in soils and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium VI is used in a number of industrial applications including electroplating, stainless steel production, leather tanning, textile manufacturing, dyes and pigments, wood preservation and as an anti-corrosion agent. Chromium occurs naturally in deep aquifers and can also enter drinking water through industrial discharges. In drinking water, chromium VI is very stable and soluble, whereas chromium III is not very soluble. Chromium VI is the more toxic form and is known to cause lung cancer in humans when inhaled, but the human health effects from ingestion are still a subject of conjecture.

There are no current drinking water standards for chromium VI. Total chromium (including chromium III and chromium VI) is regulated in California with an MCL of 50 μg/L. On August 20, 2009, the OEHHA released a draft PHG of 0.06 μg/L for chromium VI in drinking water. The PHG is a health-protective, non-regulatory level that will be used by CDPH in its development of an MCL. CDPH will set the eventual MCL as close to the PHG as technically and economically feasible.

Metropolitan monitors chromium levels in their source and treated waters and has found all samples to be below the State’s 1 μg/L detection level for purposes of reporting, with the exception of the influent to the Mills Water Treatment Plant. Metropolitan’s 2010 Regional Urban Water Management Plan reports the following findings with respect to chromium VI levels found in their source and treated waters:

- Colorado River chromium VI levels over the past 10 years were mostly not detected (<0.03 μg/L) but when detected, ranged from 0.03 – 0.08 μg/L.
- SWP chromium VI levels over the past 10 years ranged from 0.03 – 0.8 μg/L.

- Treated water chromium VI levels over the past 10 years ranged from 0.03 – 0.7 μg/L.
- The slight increase in chromium VI levels in treated water (as compared with Colorado River water) is caused from the oxidation (chlorination and ozonation) of natural background chromium (total) to chromium VI.
- Chromium VI in Metropolitan's groundwater pump-in storage programs in the Central Valley has ranged from non-detect (< 0.03 μg/L) to 9.1 μg/L with the average for the different programs ranging from 1.4 to 5.0 μg/L.
- Chromium VI has been detected in a groundwater aquifer on the site of a Pacific Gas and Electric (PG&E) gas compressor station located along the Colorado River near Topock, Arizona. However, monitoring results along the river, both upstream and downstream of the Topock site, have ranged from non-detect (<0.03 μg/L) to 0.06 μg/L.

N-nitrosodimethylamine (NDMA)

N-nitrosodimethylamine (NDMA) is part of a family of organic chemicals called nitrosamines. NDMA is a byproduct of the disinfection of some natural waters with chloramines, which are used at Metropolitan treatment plants as a secondary disinfectant. Both the USEPA and CDPH consider NDMA to be a probable human carcinogen. While CDPH has not yet established an MCL for NDMA, they did establish a 0.01 μg/L notification level in 1998. OEHHA also set a PHG for NDMA of 0.003 μg/L in 2006 and recommended that concentrations greater than 0.01 μg/L be included in a utility's annual Consumer Confidence Report.

Metropolitan has monitored its source waters (at treatment plant influents) and treated waters on a quarterly basis since 1999. Test results for NDMA in Metropolitan's system have ranged from non-detect (< 0.002 μg/L) to 0.014 μg/L.

Metropolitan is engaged in several projects, which will lead to a better understanding of the watershed sources and occurrence of NDMA precursors in their source waters. That information can then be used to develop treatment strategies aimed at minimizing NDMA formation in drinking water treatment plants and distribution systems. To date, special studies conducted by Metropolitan have shown the use of advanced oxidation processes can be effective in removing NDMA. Other treatment processes such as biological, membrane, and carbon adsorption, may also be effective, but have not yet been studied.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are a growing concern to the water industry. Numerous studies have reported the occurrence of these emerging contaminants in treated wastewater and surface water, as well as in some finished drinking water in the United States and other countries. The sources of PPCPs in the aquatic environment can include treated wastewater, industrial discharges, agricultural run-off, and leaching from municipal landfills. There is no current evidence of human health risks from long-term exposure to the low concentrations (low ng/L; parts per trillion) of PCPs found in some drinking water. There are also no current regulatory requirements for PPCPs in drinking water.

In 2007, Metropolitan implemented a monitoring program to measure the occurrence of PPCPs and other organic wastewater contaminants in its treatment plant effluents and at selected source water locations within the Colorado River and SWP watersheds. Some PPCPs were detected at very low ng/L levels, which is consistent with reports from other utilities. Metropolitan will continue to refine their analytical methods, which will lead to a better understanding of these occurrence issues and their impact on drinking water sources in California.

Methyl Tertiary Butyl Ether (MTBE) – A Decreasing Concern

Although no longer a major concern, Methyl tertiary-butyl ether (MTBE) is still somewhat of a concern. MTBE was the primary oxygenate in virtually all the gasoline used in California, prior to discovering it contaminated groundwater supplies and had also been found in surface water supplies. Following that discovery, MTBE was banned in California as of December 31, 2003 and was subsequently replaced by ethanol which is now the primary oxygenate in use. CDPH has adopted a primary MCL of 13 μg/L for MTBE based on carcinogenicity studies in animals. MTBE has a California secondary MCL of 5 μg/L, which was established based on taste and odor concerns.

MTBE was introduced into surface water bodies from the motor exhausts of recreational watercraft. With that in mind, Metropolitan has taken steps at Diamond Valley Lake and Lake Skinner, to reduce the potential for MTBE contamination. In 2003, Metropolitan's Board banned the use of MTBE fuel in these reservoirs and authorized implementation of a monitoring program to detect the presence of MTBE in the lakes. In recent years, MTBE monitoring test results in source waters have remained at non-detectable levels (below 3 μg/L).

MTBE still presents a significant problem to local groundwater basins. Leaking underground storage tanks and previous poor fuel handling practices at local gas stations may continue to provide a large source of MTBE. MTBE, which is very soluble in water and has low affinity for soil particles, moves quickly into the groundwater. Some local groundwater producers within Metropolitan's service area have been forced to abandon some wells due to MTBE contamination. Unfortunately, MTBE is also resistant to chemical and microbial degradation in water, thereby making treatment more difficult than that employed to remove other gasoline components. However, a combination of an advanced oxidation process (typically ozone and hydrogen peroxide) followed by granular activated carbon has been found to be effective in reducing the levels of these contaminants.

Although some groundwater supplies remain contaminated with this highly soluble chemical, contamination of Metropolitan's surface water supplies are no longer a problem. Improved underground storage tank requirements and monitoring procedures, as well as the phase-out of MTBE as a fuel additive, has decreased the likelihood of MTBE groundwater problems in the future.

Imported Water Quality Programs

Metropolitan supports and is involved in many programs that address water quality concerns related to both the SWP and Colorado River supplies. Some of the programs and activities include:

- Source Water Protection – Protecting the source of water supplies is of paramount importance to providing safe and reliable drinking water. CDPH requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years in accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations. The purpose of this survey is to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities to protect and improve source water quality. The most recent sanitary surveys for Metropolitan's water sources were completed in 2005 and 2006[13]. The next Sanitary Surveys for the watersheds of the Colorado River and the SWP will report on water quality issues and monitoring data through 2010. Metropolitan has an active source water protection program and continues to advocate on behalf of numerous SWP and Colorado River water quality protection issues.
- Support of SWP Water Quality Programs – Metropolitan continues to support DWR policies and programs aimed at maintaining or improving the quality of SWP water delivered to Metropolitan. Some examples of this support include:
  - Support of the DWR policy to govern the quality of non-project water conveyed by the California Aqueduct.
  - Support of the expansion of DWR's Municipal Water Quality Investigations Program beyond its Bay-Delta core water quality monitoring and studies to include enhanced water quality monitoring and forecasting of the Delta and SWP. These programs are designed to provide early warning of water quality changes that will affect treatment plant operations both in the short-term (hours to weeks) and seasonally.
- Water Quality Exchanges – Metropolitan has implemented selective withdrawals from the Arvin-Edison storage program and exchanges with the Kern Water Bank to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water during periods of good water quality and then allow for their withdrawal during times of lesser water quality, thus providing better overall water quality through dilution of SWP water deliveries.

[13] Sanitary Surveys include Metropolitan's *Colorado River Watershed Sanitary Survey, 2005 Update* and State Water Project Contractors Authority *California State Water Project Watershed Sanitary Survey, 2006 Update*.

- Water Supply Security – In 2001, Metropolitan added new security measures to protect its water supply storage and conveyance facilities and continues to upgrade and refine those procedures. Changes have included an increase in the number of water quality tests conducted each year (Metropolitan now conducts over 300,000 analytical tests on samples collected within their service area and source waters), as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.

3.1.3 Groundwater

Groundwater has been used in Ventura County for many years, for agricultural irrigation, and for municipal and industrial water supply. Historically, the aquifer system in southern Ventura County has been in a state of overdraft, primarily in the Lower Aquifer System (LAS), which has led to seawater intrusion. The non-consumptive portion of imported water used by the majority of Calleguas purveyor customers is treated at local wastewater treatment facilities and discharged to the Calleguas Creek watershed. This water ultimately percolates into the Upper Aquifer System (UAS), increasing groundwater levels in the region. Unfortunately, water in the UAS can have elevated levels of chlorides and TDS. As described in more detail in later sections, Calleguas, Ventura County Waterworks District No. 1 and other Calleguas member agencies are active participants in regional efforts to put some of this water to beneficial use by advancing groundwater desalter projects for groundwater recovery.

Table 3.1-1 summarizes groundwater quality in the basins that underlie Calleguas' service area. The East Las Posas Basin supplies all the local groundwater for the Ventura County Waterworks District No. 1. Groundwater in Calleguas' service area is generally high in TDS and occasionally high in nitrate concentrations. It is important to note that water quality within the basins can vary based on the location of the sample well, conditions of the sample well, and groundwater conditions on the day the sample was taken.

Table 3.1-1
Groundwater Basin Water Quality Summary

Groundwater Basin	Average/Maximum TDS Level (mg/L)	Maximum Nitrate Level (mg/L)
Arroyo Santa Rosa	817 / 1,385	286
South Las Posas	709 / 2,318	144
North (East/West) Las Posas	752 / 2,135	186
Pleasant Valley	1,110 / 3,490	192
Oxnard Forebay	N/A / 2,460	222
Oxnard Plain	N/A / 3,535	226

Source: FCGMA website
N/A – Information not available
Data not available for Simi Valley and Conejo Valley

Seawater intrusion has long been a concern and was the issue that precipitated the creation of the FCGMA. The intrusion occurs exclusively along the coastline in the Oxnard Plain Basin. Elevated salts concentrations have also been observed in some portions of the Pleasant Valley Basin and appear to be related to marine sediments, oil field brines, and other geologic sources.

Chloride has also become a problem in the East and South Las Posas Basins and groundwater from these basins must be blended with lower-chloride water to be suitable for irrigation. This problem appears to have migrated downstream, with some of the City of Camarillo's wells now affected (FCGMA, 2007 Update to the FCGMA Groundwater Management Plan, 2007).

A high nitrate concentration in the groundwater is a problem localized in the Oxnard Plain and Forebay Basins. Potable water wells in the impacted areas are often affected during and following dry periods. The primary sources of nitrate are septic systems and agricultural fertilizer. To address the problem, septic systems are now prohibited in the Oxnard Plain Forebay and best management practices (BMPs) are being implemented to limit agricultural contributions.

Groundwater Quality Improvement Projects

VCWWD No. 1 has prepared a Preliminary Design Report for the Moorpark Desalter project that would improve water quality in the South Las Posas Groundwater Basin as well as reduce its dependency on imported water by pumping groundwater from the South Las Posas Basin with high TDS and chlorides to provide suitable potable or even irrigation water supply.

There has been a significant change in average groundwater levels over the past 40 years in the South Las Posas Basin, with groundwater levels rising more than 100 feet during this period. The mechanism for this rise in groundwater elevations is the increased recharge from percolation beneath the Arroyo Las Posas as discharges from the Moorpark and Simi Valley wastewater treatment plants and dewatering wells in Simi Valley have increased year-round flow in the arroyo. The entire alluvial aquifer near the arroyo has progressively filled to the elevation of the arroyo, starting in the easternmost portion of the basin in the 1960s and moving westward through the 1990s (Bachman, 2002). Water from the filled alluvial aquifer has percolated downward into the underlying LAS, creating a recharge mound in the LAS that extends from the arroyo northward into the East Las Posas Basin.

Salts in the groundwater have increased in the South Las Posas Basin and the southwestern portion of the East Las Posas Basin as the shallow aquifer filled along Arroyo Las Posas. These salts apparently were leached from the shallow aquifer as groundwater levels reached record highs, saturating sediments that have been unsaturated for the historic period. These salts apparently migrated vertically with percolating groundwater into the LAS and then laterally into the main portion of the East Las Posas

Basin as the recharge mound developed. Some of this groundwater is even unsuitable for irrigation without being blended with better-quality water.

The Moorpark Desalter would be a 5 million gallon per day (mgd) brackish groundwater treatment facility. The desalter would be located outside the City of Moorpark and within the District service area. Reverse osmosis (RO) treatment technology would be used to produce potable quality water. Brine waste, containing concentrated salts from the RO process, would be discharged to the Calleguas Salinity Management Pipeline and exported out of the Calleguas Creek Watershed to the Pacific Ocean.

As 5,000 AFY of high TDS water is removed from the Basin, space would be created for better-quality stormwater infiltration to percolate into the aquifer; the majority of these flows now bypass the recharge areas because the shallow South Las Posas aquifer is full.

3.2 WATER QUALITY EFFECT ON WATER MANAGEMENT STRATEGIES AND SUPPLY RELIABILITY

The previous section summarized the general water quality issues of Metropolitan's imported water and overall groundwater supplies within the FCGMA area. The same water quality concerns apply to the District's water. The District's groundwater sources would be the most vulnerable to possible contamination from agricultural operations due to their use of pesticides and fertilizers. The District has iron and manganese quality issues and has installed treatment facilities at Well #15 and Well #20 and continues to monitor its groundwater wells for the first indication of problems as part of their water management strategy.

The District has not experienced any significant water quality problems in recent years and does not anticipate any significant changes in its available water supply due to water quality issues in the future due in large part to the mitigation actions undertaken by Metropolitan, Calleguas, and FCGMA as described earlier.

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4 WATER RELIABILITY PLANNING

4.1 RELIABILITY OF WATER SUPPLIES

This section provides a description of the efforts of Metropolitan, Calleguas and the District in securing an adequate and reliable regional water supply. This section also includes further discussion of these agencies and their roles in water supply reliability, and the near and long-term efforts they are involved with to ensure future reliability of water supplies to the District and the region as a whole.

The Southern California region faces a challenge in satisfying demands and securing firm water supplies. Increased environmental regulations and the competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth generally leads to increased regional water demands, which results in larger demands on local supplies.

Reliability is a measure of a water system's expected success in managing water shortages. Good reliability planning requires accurate answers to the following questions:

1. What are the expected frequency and severity of shortages?
2. How will additional water management measures likely affect the frequency and severity of shortages?
3. How will available contingency measures reduce the impact of shortages when they occur?

The reliability of the District's water supply is currently dependent on the reliability of both the groundwater managed by the FCGMA and the imported water supplies managed by Metropolitan and delivered by Calleguas. Despite the ongoing regional water supply challenges, the goals and statutory mission of these agencies are to identify and develop projects to meet regional water demands.

State funding has been made available, through California voters' approval, to increase reliability of state water supplies. In March 2000, California voters approved Proposition 13, which authorized the State to issue $1.97 billion of its general obligation bonds for water projects. Additionally, California voters approved Proposition 50 in November 2002 and Proposition 84 in November 2006, which authorized the issuance by the State of $3.4 billion and $5.4 billion, respectively, of general obligation bonds for water projects. Types of water projects eligible for funding under Propositions 13, 50, and 84 include water conservation, groundwater storage, water treatment, water quality, water security and Colorado River water management projects.

4.1.1 Regional Agencies and Water Reliability

Metropolitan Water District of Southern California (Metropolitan)

Metropolitan was formed in the late 1920's with the primary goal of providing reliable water supplies to meet the water needs of its service area at the lowest possible cost. Collectively, charter members recognized the limited water supplies available within the region, and realized that continued prosperity and economic development of Southern California depended upon the acquisition and careful management of an adequate supplemental water supply. This foresight made the continued development of Southern California possible.

Metropolitan acquires water from Northern California via the State Water Project (SWP) and from the Colorado River via the Colorado River Aqueduct (CRA) to supply water to most of Southern California. As a wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its 26 member agencies. One such member agency is the Calleguas Municipal Water District, of which the District is a member agency.

Through a series of Integrated Resources Plans initiated in 1996 and most recently updated in 2010, Metropolitan has worked toward identifying and developing water supplies to provide 100 percent reliability. Due to competing needs and uses for all of the water sources and regional water operational issues, Metropolitan undertook a number of planning processes: the Integrated Resources Planning (IRP) Process, the Water Surplus and Drought Management (WSDM) Plan, the Strategic Planning Process, the Report on Metropolitan Water Supplies: A Blueprint for Water Reliability, and most recently, the October 2010 IRP update and the November 2010 Regional Urban Water Management Plan. Combined, these documents provide a framework and guidelines for optimum future water planning.

The reliability and operational issues related to Metropolitan's various sources of supply are discussed in detail by major source in the subsequent subsections of this Urban Water Management Plan. Metropolitan provides imported water supplies to the District through the District's Metropolitan member agency, Calleguas. Metropolitan is the wholesale water agency that serves supplemental imported water from northern California through the State Water Project (SWP) and the Colorado River to 26 member agencies located in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties, of which Calleguas is one.

The construction of the SWP was authorized by the State Legislature in 1951. Eight years later, the Legislature passed the Burns-Porter Act, which provided a mechanism for bonds to be issued to pay for the construction of certain portions of the SWP facilities. The California Department of Water Resources (DWR) has entered into contracts with water districts and regional agencies (SWP Contractors) specifying the amount of SWP water to be delivered to each SWP Contractor. Each SWP Contractor was provided with a contract amount and capacity rights to the SWP aqueduct and storage system in return for payments intended to cover operation and maintenance, bondholder obligations, and repayment of moneys loaned from the California Water Fund. DWR water supply contracts contemplate SWP eventual delivery of 4.2 million AFY to 29 SWP Contractors. Although the SWP is not fully constructed and cannot yet deliver the full 4.2 million AFY in all years, the SWP has fully met SWP Contractors' water needs twelve out of the 17 years following the end of a six year drought in 1992. The dry years include 1994, 2001, and 2007 through 2009. Of SWP water deliveries, about 70 percent is delivered to SWP urban contractors and about 30 percent is delivered to SWP agricultural contractors. Kern County Water Agency and Metropolitan are the largest Contractors with DWR for SWP water.[14]

From a statewide perspective, the maximum capacity of the overall SWP transportation system is generally limited by the capacity of the system pumps. The capacity of the California Aqueduct is 10,300 cubic feet per second (cfs) at its northern end, and 4,480 cfs below the Edmonston pumping plant (1,000 cfs equates to approximately 82.6 acre-feet per hour, 1,983 acre-feet per day and 724,000 AFY). If these transportation rates were maintained for a full year, they would result in the transport of approximately 7.2 million acre-feet near the Delta and 3.2 million acre-feet to users in Southern California.[15]

Demand can have a significant effect upon the reliability of a water system. For example, if the demand occurs only three months in the summer, a water system with a sufficient annual supply but insufficient water storage may not be able to reliably meet the demand. If, however, the same amount of demand is distributed over the year, the system could more easily meet the demand because the need for water storage is reduced. Because the District overlies the Las Posas Basin and can utilize the Basin to smooth out seasonal peaks, its imported water reliability is enhanced.

Metropolitan's SWP imported water is stored at Castaic Lake on the western side of their service area and at Silverwood Lake near San Bernardino. Metropolitan water imported from the Colorado River via the CRA is stored at Diamond Valley Lake and Lake Mathews in Riverside County.

Metropolitan member agencies receive imported water at various delivery points along their system, and pay for it at tiered and/or uniform rates established by the Board, depending on the class of service. Metropolitan has recently increased its ability to supply water, particularly in dry years, through implementation of storage and transfer programs. Metropolitan's 26 member agencies deliver to their customers a combination of groundwater, local surface water, recycled water and imported water purchased from Metropolitan. For some member agencies, Metropolitan supplies all the water used within their service area, while others obtain varying amounts of water from Metropolitan

[14] See, generally DWR Bulletin No. 132-06 and latter supplements to Bulletin No. 13; report available at this link: http://www.water.ca.gov/swpao/bulletin.cfm .

[15] DWR, Bulletin No. 132-05, December 2006; report available at this link: http://www.water.ca.gov/swpao/bulletin.cfm

to supplement local supplies. Metropolitan has provided between 45 and 60 percent of the municipal, industrial and agricultural water used in its service area.[16]

Historical water demands in the Metropolitan service area increased from 3.14 million acre feet (MAF) in 1980 to 3.93 MAF in 1990. Total retail water demand is projected to grow from its current 4.03 MAF in 2010 to a projected 4.27 MAF in 2035.[17] For Ventura County, according to Metropolitan, demands are projected to increase approximately 9.0 percent between 2010 and 2035.[18] Table 4.1-1 shows the historic and projected total retail water demands for Metropolitan's Ventura County service area. The water demand forecasts account for water savings resulting from plumbing codes, price effects, and actual and projected implementation of water conservation Best Management Practices as mandated by Senate Bill x7-7.[19]

Table 4.1-1
Total Retail Water Demand in Metropolitan's Service Area for Ventura County (Includes Municipal and Industrial, and Agriculture in AF)

Actual			Interpolated	Projected				
1995	2000	2005	2010	2015	2020	2025	2030	2035
108,000	132,000	158,000	166,000	170,000	170,000	174,000	178,000	181,000

Source: November 2010 Regional Urban Water Management Plan for the Metropolitan Water District of Southern California, Table A.1-5

Colorado River Aqueduct (CRA)

The Colorado River was Metropolitan's original source of water after the agency's establishment in 1928. Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the U.S. Secretary of the Interior. Water from the Colorado River or its tributaries is also available to other users in California, as well as to users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming (the "Colorado River Basin States"), resulting in both competition and the need for cooperation among these holders of Colorado River entitlements. In addition, under a 1944 treaty, Mexico has an allotment of 1.5 million acre-feet of Colorado River water annually, except in the event of extraordinary drought or serious accident to the delivery system in the United States, when the water allotted to Mexico can be curtailed. Mexico can also schedule delivery of an additional 200,000

[16] Metropolitan Water District of Southern California, Urban Water Management Plan, November 2010, page 1-6; Plan can be accessed at this link: http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf
[17] Ibid., Table A.1-5
[18] Ibid., Table A.1-5
[19] Ibid., Table A.1-5

acre-feet of Colorado River water per year if water is available in excess of the requirements in the United States and the 1.5 million acre-feet allotted to Mexico.

The Colorado River Aqueduct, which is owned and operated by Metropolitan, transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County. After deducting for conveyance losses and considering maintenance requirements, up to 1.2 million acre-feet of water a year may be conveyed through the CRA to Metropolitan's member agencies, subject to availability of Colorado River water for delivery to Metropolitan as described below.

California is apportioned the use of 4.4 million acre-feet of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California and Nevada. In addition, California has historically been allowed to use Colorado River water apportioned to, but not used by, Arizona and Nevada when such supplies have been requested for use in California. Under the 1931 priority system that has formed the basis for the distribution of Colorado River water made available to California, Metropolitan holds the fourth priority right to 550,000 acre-feet per year. This is the last priority within California's basic apportionment of 4.4 million acre-feet. In addition, Metropolitan holds the fifth priority right to 662,000 acre-feet of water, which is in excess of California's basic apportionment.

Until 2002, Metropolitan had been able to take full advantage of its fifth priority right as a result of the availability of surplus water and apportioned but unused water. However, Arizona and Nevada increased their use of water from the Colorado River, leaving no unused apportionment available for California since the late 1990s. In addition, a severe drought in the Colorado River Basin has reduced storage in system reservoirs, resulting in no surplus water being available since 2002. Prior to 2002, Metropolitan could divert over 1.2 million acre-feet in any year, but since that time, Metropolitan's deliveries of Colorado River water varied from a low of 535,000 acre-feet in 2006 to a projected high of 1,150,000 acre-feet in 2010[20].

Metropolitan has taken steps to augment its share of Colorado River water through agreements with other agencies that have rights to use such water. Under a 1988 water conservation agreement (the "1988 Conservation Agreement") between Metropolitan and the Imperial Irrigation District (IID), IID has constructed and is operating a number of conservation projects that are currently conserving 105,000 acre-feet of water per year. In 2007, the conserved water augmented the amount of water available to Metropolitan by 85,000 acre-feet and, by prior agreement, to the Coachella Valley Water District (CVWD) by 20,000 acre-feet.[21]

In 1992, Metropolitan entered into an agreement with the Central Arizona Water Conservation District (CAWCD) to demonstrate the feasibility of CAWCD storing Colorado River water in central Arizona for the benefit of an entity outside of the State of Arizona. Pursuant to this agreement, CAWCD created 80,909 acre-feet of long-term

[20] Ibid., Table A.2-1
[21] Ibid, Page A.3-4

storage credits that may be recovered by CAWCD for Metropolitan. Metropolitan, the Arizona Water Banking Authority, and CAWCD executed an amended agreement for recovery of these storage credits in December 2007. In 2007, 16,804 acre-feet were recovered. Metropolitan requested 25,000 acre-feet be recovered in 2008, and expects to request the balance of the storage credits over the next several years. Water recovered by CAWCD under the terms of the 1992 agreement allows CAWCD to reduce its use of Colorado River water, resulting in Arizona having an unused apportionment. The Secretary of the Interior is making this unused apportionment available to Metropolitan under its Colorado River water delivery contract.

In April 2008, Metropolitan's Board authorized the expenditure of $28.7 million to join the CAWCD and the Southern Nevada Water Authority (SNWA) in funding the construction of a new 8,000 acre-foot off-stream regulating reservoir near Drop 2 of the All-American Canal in Imperial County. The Drop 2 Reservoir is expected to save up to 70,000 acre-feet of water per year by capturing and storing water that would otherwise be lost. In return for its funding, Metropolitan received 100,000 acre-feet of water that is stored in Lake Mead until recovered, with annual delivery of up to 34,000 acre-feet of water through 2010 and up to 25,000 acre-feet between 2011 and 2036. Besides the additional water supply, the new reservoir will add to the flexibility of Colorado River operations.

Metropolitan and the Palo Verde Irrigation District (PVID) signed the program agreement for a Land Management, Crop Rotation and Water Supply Program in August 2004. This program provides up to 118,000 acre-feet of water available to Metropolitan in certain years. The term of the program is 35 years. Fallowing of approximately 20,000 acres of land began on January 1, 2005. In 2005, 2006, 2007, 2008 and 2009 approximately 108,700, 105,500, 72,300, 94,300 and 102,200 acre-feet, respectively, of water were saved through these programs.[22]

With Arizona's and Nevada's increasing use of their respective apportionments and the uncertainty of continued Colorado River surpluses, in 1997 the Colorado River Board of California, in consultation with Metropolitan, IID, PVID, CVWD, the Los Angeles Department of Water and Power and the San Diego County Water Authority (SDCWA), embarked on the development of a plan for reducing California's use of Colorado River water to its basic apportionment of 4.4 million acre-feet when use of that basic allotment is necessary (California Plan). In 1999, IID, CVWD, Metropolitan and the State of California agreed to a set of Key Terms aimed at managing California's Colorado River supply. These Key Terms were incorporated into the Colorado River Board's May 2000 California Plan that proposed to optimize the use of the available Colorado River supply through water conservation, transfers from higher priority agricultural users to Metropolitan's service area and storage programs.

To implement these plans, a number of agreements have been executed. One such agreement, the Quantification Settlement Agreement (QSA), is a landmark agreement

[22] Ibid, page A.3-7

signed by the four California Colorado River water use agencies and the U.S. Secretary of the Interior, which will guide reasonable and fair use of the Colorado River by California through the year 2037. The QSA was authorized in October 2003 and defined Colorado River water deliveries to the four California agencies as well as facilitated transfers from agricultural agencies to urban users. The QSA is a critical component of California's Colorado River Water Use Plan.

State Water Project (SWP)

The SWP is owned and operated by the California Department of Water Resources. The reliability of the SWP impacts Metropolitan's member agencies' ability to plan for future growth and supply. On an annual basis, each of the 29 SWP contractors, including Metropolitan, request an amount of SWP water based on their anticipated yearly demand. In most cases, Metropolitan's requested supply is equivalent to its full Table A Amount,[23] currently at 1,911,500 AFY, and in certain wetter years additional supply may be made available. The full Table A amount is defined as the maximum amount of imported water to be delivered and is specified in the contract between the DWR and the contractor. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A Amount, but instead, are allocated a percentage of that amount based on the available supply. Table 4-1-2 lists the historical SWP deliveries to Metropolitan and the delivery's percentage compared to the full Table A amount. Once the percentage is set early in the water year, the agency can count on that amount of supply or more in the coming year. The percentage is typically set conservatively and is then held or adjusted upwards later in the year based on a reassessment of precipitation and snow pack.

Litigation filed by several environmental interest groups (NRDC v. Kempthorne (Case No. 05CV01207-OWW-GSA); Pacific Coast Federation of Fishermen's Associations v. Gutierrez (Case No. 06CV00245-OWW)) has alleged that certain biological opinions and incidental take permits granted by state and federal agencies for water permits in the Sacramento-San Joaquin Bay Delta inadequately analyzed impacts on species listed as endangered under the Federal Endangered Species Act (ESA). In 2007, Federal District Judge Wanger issued a decision, finding the United States Fish and Wildlife Service's biological opinion for Delta smelt to be invalid. Judge Wanger issued an Interim Remedial Order and Findings of Fact and Conclusions of Law requiring that the SWP

[23] Two types of deliveries are assumed for the SWP contractors: Table A and Article 21. Table A Amount is the contractual amount of allocated SWP supply, set by percentage amount annually by DWR; it is scheduled and uninterruptible. Article 21 water refers to the SWP contract provision defining this supply as water that may be made available by DWR when excess flows area available in the Delta (i.e., Delta outflow requirements have been met, SWP storage south of the Delta is full, and conveyance capacity is available beyond that being used for SWP operations and delivery of allocated and scheduled Table A supplies). Article 21 water is made available on an unscheduled and interruptible basis and is typically available only in average to wet years, generally only for a limited time in the later winter.

and Central Valley Project (CVP) operate according to certain specified criteria until a new biological opinion for the Delta smelt was issued by the United States Fish and Wildlife Service.

Table 4.1-2
SWP Deliveries to Metropolitan (AF)[24]

Year	SWP Delivery	% of Full Table A
1981	826,951	43%
1982	856,996	45%
1983	385,308	20%
1984	501,682	26%
1985	740,410	39%
1986	756,142	40%
1987	769,603	40%
1988	957,276	50%
1989	1,215,139	64%
1990	1,457,676	76%
1991	624,861	33%
1992	746,991	39%
1993	663,390	35%
1994	845,305	44%
1995	451,305	24%
1996	642,871	34%
1997	724,393	38%
1998	521,255	27%
1999	790,538	41%
2000	1,442,615	75%
2001	1,119,408	59%
2002	1,413,745	74%
2003	1,560,569	82%
2004	1,792,246	94%
2005	1,720,350	90%
2006	1,911,500	100%
2007	1,146,900	60%
2008	669,025	35%
2009	764,600	40%
2010	955,750	50%
2011	1,529,200	80%

[24] Table A data extracted from DWR Website; 2011 data represents the initial allocation of 25% plus the subsequent notices to SWP Contractors in December 2010, January, and April, 2011 increasing the allocation to 50%, 60% and 80%, respectively. Metropolitan's full Table A amount is 1,911,500 AFY

DWR bi-annually prepares a report on the current and future for SWP water supply conditions, if no significant improvements are made to convey water past the Sacramento-San Joaquin Delta (Delta) or to store the more variable run-off expected with climate change. The latest 2009 State Water Project Delivery Reliability Report (2009 Report) is the most current of these reports dated August 2010.

The 2009 Report shows a continuing erosion of the ability of the SWP to deliver water. For current conditions, the dominant factor for these reductions is the restrictive operational requirements contained in the federal biological opinions. For future conditions, it is these requirements and the forecasted effects of climate change.

Deliveries estimated for the 2009 Report are reduced by the operational restrictions of the biological opinions issued by the U.S. Fish and Wildlife Service in December 2008 and the National Marine Fisheries Service in June 2009 governing the SWP and CVP operations. To illustrate the effect of these operational restrictions, the median value estimated for the primary component of SWP Table A deliveries for Current Conditions in the 2005 Report is 3,170 thousand acre feet (TAF); in the 2007 Report is 2,980 TAF; and in the 2009 Report is 2,680 TAF; for a reduction of almost 500 TAF. For the 2009 studies, the changes in run-off patterns and amounts are included along with a potential rise in sea level. Sea level rise has the potential to require more water to be released to repel salinity from entering the Delta in order to meet water quality objectives established for the Delta. The effect of the operational restrictions in addition to the incorporation of potential climate change impacts amounts to an estimated reduction of 970 TAF when the median value for annual SWP deliveries for Future Conditions in the 2005 Report (3,750 TAF) is compared to the updated value in the 2009 Report (2,600 TAF). DWR has altered operations of the SWP to accommodate species of fish listed under the Federal and California Endangered Species Acts (ESAs). These changes in project operations have influenced the manner in which water is diverted from the Bay-Delta and SWP deliveries to the southern part of the State. Restrictions on Bay-Delta pumping beginning in 2008 under the Interim Remedial Order in NRDC v. Kempthorne have resulted in reduced deliveries of SWP water to Metropolitan.

Based on DWR estimates of SWP deliveries under the Interim Remedial Order, and assuming an equal division of curtailments between the SWP and CVP,[25] Metropolitan has met firm demands in calendar years 2008, 2009 and 2010. However, Metropolitan has been withdrawing supplies from surface and groundwater storage to meet current demands. Anticipating that storage could be significantly reduced by the end of 2010, Metropolitan and its member agencies are calling for voluntary water conservation to lower demands and reduce drawdown from water storage. In fact on April 14, 2009, Metropolitan adopted a Level 2 Allocation, which equates to a 10 percent reduction in

[25] Assuming an equal division of curtailments between the SWP and the CVP is conservative and may have the effect of overstating the amount of SWP curtailment. As an example, in January 2009, the U.S. Bureau of Reclamation, which operates the CVP, provided notice to agricultural customers that it intended to not provide any water deliveries to agricultural customers in 2009. Thus, in the short term it appears as though agricultural users which receive water through the CVP may suffer deeper water cuts as compared to water purveyors which receive water from the SWP.

regional water supplies. Based on similar water supply conditions, this same level of allocation was adopted on April 13, 2010 for this current fiscal year by Metropolitan. If necessary, mandatory water allocations could be imposed in the future to cause further reductions in water use and reduce drawdown from water storage reserves. Metropolitan's member agencies and retail water suppliers in Metropolitan's service area also have the ability to implement water conservation and allocation programs, and many of the retail suppliers in Metropolitan's service area have initiated conservation measures.

To create a systemic solution to the issues facing the Delta (which have existed since the 1970's), Governor Schwarzenegger created the Delta Vision process, which is aimed at identifying long-term solutions to the conflicts in the Bay-Delta, including natural resource, infrastructure, land use and governance issues. The Delta Vision Blue Ribbon Task Force presented findings and recommendations for a sustainable Delta as a healthy ecosystem and water supply source on January 17, 2008. In addition, state and federal resource agencies and various environmental and water user entities are currently engaged in the development of the Bay-Delta Conservation Plan (BDCP), which is aimed at addressing ecosystem needs and securing long-term operating permits for the SWP. On November 18, 2010 the BDCP Steering Committee released a Working Draft of all Plan components completed to date. A public draft BDCP is expected to be completed and available for public review in 2011. Following a public review period, a final BDCP is expected before the end of 2012. Recently, statewide officials have expressed support for the construction of the peripheral canal, which would alleviate some of the delta species considerations by transferring river water south before it reaches the Bay Delta.

The issues, such as the recent decline of some fish species in the Delta and surrounding regions and certain operational actions in the Delta, may impact Metropolitan's water supply from the Delta. SWP operational requirements may be further modified through the consultation process for new biological opinions for listed species under the Federal ESA or from the California Department of Fish and Game's actions regarding the California ESA. Decisions in current or future litigation, listings of additional species (such as the longfin smelt), or new regulatory requirements could adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations.

Water Transfer and Exchange Programs

California's agricultural activities consume approximately 34 million acre-feet of water annually, which is 80 percent of the total water used for agricultural and urban uses and 40 percent of the water used for all consumptive uses. Voluntary water transfers and exchanges can make a portion of this agricultural water supply available to support the State's urban areas. Such existing and potential water transfers and exchanges are an important element for improving the water supply reliability within Metropolitan's service area and accomplishing the reliability goal set by Metropolitan's Board of Directors. Metropolitan is currently pursuing voluntary water transfer and exchange programs with state, federal, public and private water districts and individuals. The following information on these programs has been extracted from Metropolitan's 2010 Regional UWMP:

- *Semitropic Storage Program*: Metropolitan has a groundwater storage program with Semitropic Water Storage District located in the southern part of the San Joaquin Valley. The maximum storage capacity of the program is 350 TAF. The specific amount of water Metropolitan can store in and subsequently expect to receive from the programs depends upon hydrologic conditions, any regulatory requirements restricting Metropolitan's ability to export water for storage, and the demands placed on the Semitropic Program by other program participants. During the recent dry year of 2008, the storage program delivered 125 TAF to Metropolitan. During wet years, Metropolitan has the discretion to use the program to store portions of its SWP entitlement water that are in excess of the amounts needed to meet Metropolitan's service area demand. In Semitropic, the water is delivered to district farmers who use the water in-lieu of pumping groundwater. During dry years, the districts return Metropolitan's previously stored water to Metropolitan by direct groundwater pump-in return and the exchange of State Water Project entitlement water.
- *Arvin-Edison Storage Program*: Metropolitan amended the groundwater storage program with Arvin-Edison Water Storage District in 2008 to include the South Canal Improvement Project. The project increases the reliability of Arvin-Edison returning higher water quality to the California Aqueduct. The program storage capacity is 350 TAF. The specific amount of water Metropolitan can expect to store in and subsequently receive from the programs depends upon hydrologic conditions and any regulatory requirements restricting Metropolitan's ability to export water for storage. The storage program is estimated to deliver 75 TAF. During wet years, Metropolitan has the discretion to use the program to store portions of its SWP Table A supplies which are in excess of the amounts needed to meet Metropolitan's service area demand. The water can be either directly recharged into the groundwater basin or delivered to district farmers who use the water in-lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pumping in return or by exchange of surface water supplies.
- *San Bernardino Valley MWD Storage Program*: The San Bernardino Valley MWD Storage program allows for the purchase of a portion of San Bernardino Valley Municipal Water District's State Water Project supply. The program includes a minimum purchase provision of 20 TAF and the option of purchasing additional supplies when available. This program can deliver between 20 TAF and 70 TAF in dry years, depending on hydrologic conditions. The expected delivery for a single dry year similar to 1977 is 70 TAF. The agreement with San Bernardino Valley MWD also allows Metropolitan to store up to 50 TAF of transfer water for use in dry years.
- *Kern-Delta Water District Storage Program*: This groundwater storage program has 250 TAF of storage capacity. When fully developed, it will be capable of

providing 50 TAF of dry-year supply. The water can be either directly recharged into the groundwater basin or delivered to district farmers who use the water in-lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pumping in return or by exchange of surface water supplies.

- *Mojave Storage Program*: Currently operated as a demonstration program, the program will store SWP supply delivered in wet years for subsequent withdrawal during dry years. When fully developed, the program is expected to have a dry-year yield of 35 TAF depending on hydrologic conditions.
- *Central Valley Transfer Programs*: Metropolitan expects to secure Central Valley water transfer supplies via spot markets and option contracts to meet its service area demands when necessary. Hydrologic and market conditions, and regulatory measures governing Delta pumping plant operations will determine the amount of water transfer activity occurring in any year. Transfer market activity in 2003, 2005, 2008, and 2009 provide examples of how Metropolitan has secured water transfer supplies as a resource to fill anticipated supply shortfalls needed to meet Metropolitan's service area demands.
  - In 2003, Metropolitan secured options to purchase approximately 145 TAF of water from willing sellers in the Sacramento Valley during the irrigation season. These options protected against potential shortages of up to 650 TAF within Metropolitan's service area that might have arisen from a decrease in Colorado River supply or as a result of drier than expected hydrologic conditions. Using these options, Metropolitan purchased approximately 125 TAF of water for delivery to the California Aqueduct.
  - In 2005, Metropolitan, in partnership with seven other State Water Contractors, secured options to purchase approximately 130 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was 113 TAF. Metropolitan also had the right to assume the options of the other State Water Contractors if they chose not to purchase the transfer water. Due to improved hydrologic conditions, Metropolitan and the other State Water Contractors did not exercise these options.
  - In 2008, Metropolitan in partnership with seven other State Water Contractors, secured approximately 40 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 27 TAF.
  - In 2009, Metropolitan in partnership with eight other buyers and 21 sellers participated in a statewide Drought Water Bank, which secured approximately 74 TAF, of which Metropolitan's share was approximately 37 TAF.

Metropolitan's recent water transfer activities have demonstrated its ability to develop and negotiate water transfer agreements either working directly with the agricultural districts who are selling the water or through a statewide Drought Water Bank. Because of the complexity of cross-Delta transfers and the need to optimize the use of both CVP and SWP facilities, DWR and USBR are critical players in the water transfer process, especially when shortage conditions increase the general level of demand for transfers and amplify ecosystem and water quality issues associated with through-Delta conveyance of water. Therefore, Metropolitan views state and federal cooperation to facilitate voluntary, market-based exchanges and sales of water as a critical component of its overall water transfer strategy.

In addition to the previously mentioned programs, Metropolitan also manages or participates in the following existing SWP programs located outside of its service area:

- *Sacramento Valley Water Management Agreement (Phase 8 Settlement)*: Metropolitan is a signatory to the Sacramento Valley Water Management Agreement (Phase 8 Settlement) that includes work plans to develop and manage water resources to meet Sacramento Valley in-basin needs, environmental needs under the SWRCB's Water Quality Control Plan, and export supply needs for both water demands and water quality. The agreement specifies about 60 water supply and system improvement projects by 16 different entities in the Sacramento Valley.
- *Monterey Amendment*: Metropolitan was a signatory to the 1994 Monterey Amendment to resolve disputes between the urban and agricultural SWP contractors over how contract supplies are to be allocated in times of shortage by amending certain provisions of the long-term water supply contracts with DWR. The Monterey Amendment altered the water allocation procedures such that both shortages and surpluses would be shared in the same manner for all contractors, eliminating the prior "agriculture first" shortage provision. In turn, the agricultural contractors agreed to permanently transfer 130,000 AF to urban contractors and permanently retire 45,000 AF of their contracted supply.
- *SWP Terminal Storage:* Metropolitan has contractual rights to 65,000 AF of flexible storage at Lake Perris (East Branch terminal reservoir) and 153,940 AF of flexible storage at Castaic Lake (West Branch terminal reservoir). This storage provides Metropolitan with additional options for managing SWP deliveries to maximize yield from the project.
- *Yuba Dry-year Water Purchase Program*: In December 2007, Metropolitan entered into an agreement with DWR providing for Metropolitan's participation in the Yuba Dry Year Water Purchase Program between Yuba County Water Agency and DWR through 2025.
- *Desert Water Agency/Coachella Valley Water District (DWCV) SWP Table A Transfer*: Under the transfer agreement, Metropolitan transferred 100,000 AF of its SWP Table A amount to DWCV effective January 1, 2005. DWCV pays all SWP charges for this water, including capital costs associated with capacity in the SWP to transport this water to Perris Reservoir as well as the associated variable costs. The amount of water actually delivered in any given year depends on that year's SWP allocation. Water is delivered through the existing exchange

agreements between Metropolitan and DWCV. While Metropolitan transferred 100,000 AF of its Table A amount, it retained other rights, including interruptible water service, its full carryover amounts in San Luis Reservoir, its full use of flexible storage in Castaic and Perris Reservoirs, and any rate-management credits associated with the 100,000 AF. In addition, Metropolitan is able to recall the SWP transfer water in years in which Metropolitan determines it needs the water to meet its water management goals. The main benefit of the agreement is to reduce Metropolitan's SWP fixed costs in wetter years when there are more than sufficient supplies to meet Metropolitan's water management goals, while at the same time preserving its dry-year SWP supply.

- *DWCV Advance Delivery Program*: Under this program, Metropolitan delivers Colorado River water to DWCV in advance of the exchange for their SWP Contract Table A allocations. By delivering enough water in advance to cover Metropolitan's exchange obligations, Metropolitan is able to receive DWCV's available SWP supplies in years in which Metropolitan's supplies are insufficient without having to deliver an equivalent amount of Colorado River water.
- *DWCV Other SWP Deliveries*: Since 2008, Metropolitan has provided DWCV's written consent to take delivery from the SWP facilities non-SWP supplies separately acquired by each agency. These deliveries include water acquired from the Yuba Dry Year Water Purchase Program and the 2009 Drought Water Bank.

Supply Management Strategies

On the regional level, Metropolitan has taken a number of actions to secure a reliable water source for its member agencies. Metropolitan recently adopted a water supply allocation plan for dealing with potential shortages that takes into consideration the impact on retail customers and the economy, changes and losses in local supplies, the investment in and development of local resources, and conservation achievements.[26] Additional actions taken by Metropolitan during the first half of 2008 include the adoption of a $1.9 billion spending plan, increased rates and charges,[27] and the funding of a new reservoir to benefit Colorado River supply capabilities.[28] Metropolitan's approved budget for 2010/11 included rate increases of 7.5 percent with another 7.5 percent increase planned for 2011/12 to maintain this spending for the improvement of water conveyance facilities, water transfers, and providing financial assistance to member agency's local conservation, recycling, and groundwater clean-up efforts[29].

[26] Metropolitan Water District Press Release dated February 12, 2008.
[27] Metropolitan Water District Board Meeting, March 11, 2008, and Press Release of same date, regarding spending plan and adoption of rates and charges.
[28] Metropolitan Water District Board Meeting, April 8, 2008, and Press Release of same date, regarding new reservoir.
[29] Metropolitan Water District, Annual Budget, which can be accessed at this link: http://www.mwdh2o.com/mwdh2o/pages/finance/budget/AB2011.pdf

Metropolitan also supports a number of resource management actions and measures, which promote consistency in the available water supply during dry years. These actions and measures, segregated below by category, include:

Conservation

- Providing incentives to facilitate the installation of water conserving devices. Metropolitan is also looking at refining their current incentive program to include more options, streamlined administrative processes, and more standardization across programs to increase participation. Total incentive payments for FY 2006/07 were $15.4 million and for FY 2007/08 were $18.1 million, which created 8,300 AF and 7,400 AF of new conserved water savings, respectively, bringing the total to 120,000 AF of conserved annual water savings, since 1991.
- Promoting water savings through legislative measures.
- Pursuing specific implementation strategies outlined in Metropolitan's Conservation Strategy Plan, jointly developed with its member agencies.

Local Resources (LRP)

- Providing incentives of up to $250 per acre-foot to expand water recycling and groundwater recovery programs. Eighty-six participating water recycling and groundwater recovery projects are expected to collectively produce about 363,000 AFY once fully implemented. Since inception of the LRP in 1982, Metropolitan has provided more than $244 million for the production of about 1.3 MAF of recycled water and recovered groundwater.
- Encouraging development of seawater desalination by promoting improved regional facilitation and funding. Additional information on desalination is included later in this section.
- Updating policies to allow for an open process to accept and view project applications on a continuous basis, with a goal of development of an additional 174,000 acre-feet per year of local water resources.

In-Basin Groundwater Storage

- Promoting dry-year conjunctive use programs with member and retail agencies, which provide more than 415,000 AF of additional storage within Metropolitan's service area with a contractual yield of more than 115,000 AF during dry conditions. Metropolitan has allocated $52.4 million to these programs to date. Metropolitan also has about 63,000 AF in local supplemental storage through agreements with several member agencies.

In-Basin Surface Water Storage

- Providing storage in Metropolitan's Diamond Valley, Lake Mathews and Lake Skinner Reservoirs.

- Providing flexible storage in DWR's Castaic Lake and Lake Perris Reservoirs.

Calleguas Municipal Water District (Calleguas)

Calleguas represents its members at a regional, state and federal level, and advocates for the development and protection of imported water supplies and planning along with coordinating the water needs for its service area. Calleguas' water management goals and objectives include working together with Ventura County water agencies, including the District, to focus on solutions and priorities for improving its member agencies' future water supply reliability.

Calleguas' staff also represents its member agencies' interests in such water planning efforts as Metropolitan's IRP and Water Surplus and Drought Management (WSDM) Plan, with a focus on Ventura County's water future, and other local water supply programs. Calleguas has focused its planning efforts on using existing supplies more efficiently and maximizing local water resources. Working cooperatively with local agencies, Calleguas supports a number of local recycling and groundwater recovery projects to offset increasing imported water demands.

Fox Canyon Groundwater Management Agency (FCGMA)

As previously noted, FCGMA was created by a special act of the California legislature in 1982 for the express purposes of regulating, conserving, managing, and controlling the use and extraction of groundwater to help preserve resources, and to counter seawater intrusion beneath the Oxnard Plain.[30]

Approximately 65 percent of the water used within the FCGMA boundary (shown previously in Figure 2-3) is typically obtained from local groundwater sources. 120,537 AF were withdrawn from FCGMA's seven major basins within its boundary in 2010. However, the Las Posas groundwater basin, which falls under the jurisdiction of FCGMA meets only an average of approximately 18 percent of the water supplied within the District's boundaries.

FCGMA Groundwater Management Plan

Following formation, FCGMA was required to develop a Groundwater Management Plan (GMP) to control extractions from the Oxnard and Magu aquifers within three years. In addition the agency was required to develop a plan to manage future groundwater extraction from the Lower Aquifer System (LAS). In 1985, the Agency completed its first GMP. By 2004, significant regional land use changes, the need for additional water supply, emerging water quality and quantity challenges, and developing stakeholder groundwater utilization projects caused the Agency to evaluate the need for an update to its original GMP. The goal of the GMP evaluation/update was to develop new groundwater strategies and to amend previously existing strategies with recent data and more rigorous groundwater flow model information to better assist the Agency in

[30] FCGMA 2010 Annual Report

bringing the groundwater basins into balance by year 2010. In June 2005, the Board set aside funds for United Water Conservation District staff to revise the regional groundwater model and allotted time for Agency staff to work with UWCD, Calleguas, and the FCGMA stakeholders to develop a comprehensive document that incorporated the model results and the proposed strategies.

In June 2006, the first draft of the GMP was completed and presented for public review and comment. A completely revised and updated FCGMA GMP was formally adopted by the Board on May 23, 2007. (Appendix H)

The GMP identifies a series of short-term and long-term groundwater management projects and strategies designed to address the current imbalance between water supply and demand. Most activity involved ranking of strategies via a custom matrix process and discussion of costs and importance of such strategies.

During 2010, the focus was on getting the FCGMA stakeholders to implement some of the top priority or higher ranked management strategies. Feedback from these well operators revealed that financial help was the most important aspect needed to begin work on effective management ideas evaluated in the GMP. To facilitate funding assistance, the FCGMA began to formulate ideas that would help lead toward channeling penalty or surcharge funds collected by the Agency into viable projects built and run by the individual FCGMA stakeholders.

Wastewater Service

Wastewater service within the District's service area is also provided by the District. Sewage is collected and treated by the District at the Moorpark Wastewater Treatment Plant, which has an average day capacity of 5.0 million gallons a day (mgd). Current flows to the plant are averaging just over 2.21 mgd. Following treatment, most effluent is currently discharged to percolation ponds adjacent to the plant with around 450 AFY (0.4 mgd) currently being recycled and utilized for golf course irrigation. The District currently has tertiary treatment capacity of 1.5 mgd and by 2012, should complete distribution facilities to provide up to 1,100 AFY (1.0 mgd) of tertiary treated recycled water to serve the existing Moorpark County Club golf course and existing agricultural customers. By 2020, the District should have enough effluent and plans to expand the distribution system to add additional recycled water customers in this general vicinity bringing the annual total recycled water usage to 1,600 AFY.

Regional Water Quality Control Board – Region 4

Background

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB or Regional Board) are responsible for the protection and, where possible, the enhancement of the quality of California's waters. The SWRCB sets statewide policy, and together with the Regional Boards, implements state and federal laws and regulations. Each of the nine Regional Boards adopts a Water Quality Control Plan or Basin Plan, which recognizes and reflects regional differences in existing water quality, the beneficial uses of the region's ground and surface waters, and local water quality conditions and problems.

In 1975, the Los Angeles RWQCB (LARWQCB) adopted separate Water Quality Control Plans (Basin Plans) for the Los Angeles Region comprised of the Santa Clara and Los Angeles River Basin Plans. The two Basin Plans were amended in 1978, 1990, and 1991. On June 13, 1994, the LARWQCB adopted a single Basin Plan[31] covering both basins. For planning purposes, the single Basin Plan divides the region into major surface watersheds and groundwater basins, such as the Los Angeles River and San Gabriel River Watershed. The LARWQCB periodically updates the Basin Plan to address issues that evolve over time due to increasing population and changing water demands in the region.

The Basin Plan is more than a collection of water quality goals and policies, descriptions of conditions, and discussions of solutions. It is also the basis for the LARWQCB's regulatory programs. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. Water quality problems in the region are listed in the Basin Plan, along with the causes, if known. For water bodies with quality below the recommended levels necessary for beneficial uses, plans for improving water quality are included. Legal basis and authority for the LARWQCB reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code (Porter-Cologne Water Quality Control Act) and the Clean Water Act. The LARWQCB also regulates water discharges to minimize their effects on the region's ground and surface water quality. Permits are issued by the LARWQCB under a number of these programs and authorities.

Key Regional Issues

The District's service area is in the Calleguas Creek Watershed Management Area as identified in the Basin Plan, which is basically co-terminus with the FCGMA boundary. Water quality issues in this region have been previously discussed in the section under FCGMA and are being addressed by that agency.

Water Resources and Water Quality Management

Numerous water resource management studies and projects, focused on water quality and/or water supply, are in progress in the Region under the auspices of a variety of parties. Some of these activities bear directly on the implementation of the Basin Plan, while others may lead to future Basin Plan amendments to incorporate appropriate changes, such as revised regulatory strategies for various dischargers. These investigations and the implementation of appropriate physical solutions are an essential and integral part of the effort to restore and maintain water quality in the Region.

[31] The LARWQCB Basin Plan can be accessed at this link: http://www.swrcb.ca.gov/rwqcb4/water_issues/programs/basin_plan/basin_plan_documentation.shtml

4.2 REGIONAL DEMAND AND SUPPLIES COMPARISON

Metropolitan Water District Supplies and Demands

As previously noted, the Ventura County Waterworks District No. 1 obtains its imported water from Calleguas, its Metropolitan member agency. As a part of its Integrated Water Resources Plan Implementation Report process (IRP)[32], and more recently in its November 2010 Regional Urban Water Management Plan (RUWMP), Metropolitan chose the year 1977 as the single driest year since 1922, and the years 1990-1992 as the driest multiple (3) years over that same period. These years were selected because they represent the timing of the least amount of available water resources from the SWP, a major source of Metropolitan's supply.

Concurrently with the preparation of its 2010 RUWMP, Metropolitan also prepared a 2010 IRP Update, which was adopted by the Metropolitan Board of Directors on October 12, 2010.

Based on Metropolitan's 2010 RUWMP and 2010 IRP, Tables 4.2-1 and 4.2-2 herein summarize Metropolitan's current imported supply availability and demand projections for average year, single dry year, and multiple dry years over the 20-year period beginning in 2015 and ending in 2035. The supply projections include current programs and programs under development as well as in-region storage and programs. Reference is made to Metropolitan's 2010 RUWMP for a description of these programs under development, but they include only programs Metropolitan is confident can be implemented and do not include other more speculative regional programs. Even if all the programs under development are removed, there are surpluses in all years and scenarios listed below. Demands are firm demands on Metropolitan and also include Metropolitan's commitments for IID-SDCWA transfers and canal lining.

Table 4.2-1, summarizing single dry year demand data shows surpluses in all years ranging from a low of 148.3 percent (projected supply during a single dry year as a percent of single dry year demand) in 2015 to a high of 182.3 percent in 2020. Similarly, Table 4.2-2 shows surpluses in all years ranging from a low of 118.6 percent (projected supply during an average year of a multiple (three) year dry period as a percent of average multiple year demand in 2015 to a high of 142.5 percent in 2025.

[32] Metropolitan develops Integrated Water Resources Plans (IRPs), which lay out how Metropolitan will secure and provide water to its customer base. These IRPs utilize hydrological and other data provided by DWR and are updated periodically through IRP Report Updates to reflect changing conditions.

Table 4.2-1
Metropolitan's Regional Water Supply/Demand Reliability Projections (AFY) for Average and Single Dry Years

Row	Region Wide Projections	2015	2020	2025	2030	2035
Supply Information						
A	Projected Supply During an Average Year[1]	4,073,000	4,499,000	5,140,000	4,998,000	4,865,000
B	Projected Supply During a Single Dry Year[1]	3,219,000	3,644,000	4,013,000	3,859,000	3,726,000
C = B/A	Projected Supply During a Single Dry Year as a % of Average Supply	**79.0**	**81.0**	**78.1**	**77.2**	**76.6**
Demand Information						
D	Projected Demand During an Average Year[2]	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
E	Projected Demand During a Single Dry Year[2]	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
F = E/D	Projected Demand During a Single Dry Year as a % of Average Demand	**108.2**	**111.8**	**110.9**	**110.0**	**110.1**
Surplus Information						
G = A-D	Potential Surplus During an Average Year	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000
H = B-E	Potential Surplus During a Single Dry Year	1,048,000	1,482,000	1,812,000	1,605,000	1,407,000
Additional Supply Information						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	**203.0**	**232.7**	**258.9**	**243.9**	**231.0**
J = A/E	Projected Supply During an Average Year as a % of Demand During a Single Dry Year Demand	**187.6**	**208.1**	**233.5**	**221.7**	**209.8**
K = B/E	Projected Supply During a Single Dry Year as a % of Single Dry Year Demand (including surplus)	**148.3**	**168.5**	**182.3**	**171.2**	**160.7**

[1] Projected supplies include current supplies and supplies under development. This data was obtained from Metropolitan's 2010 RUWMP, adopted by the Board on November 9, 2010 (Tables 2-9 and 2-11).

[2] Demand data obtained from Metropolitan's 2010 RUWMP, adopted by the Board on November 9, 2010 (Tables 2-9 and 2-11).

Table 4.2-2
Metropolitan's Regional Water Supply/Demand Reliability Projections (AFY) for Average and Multiple Dry Years

Row	Region Wide Projections	2015	2020	2025	2030	2035
Supply Information						
A	Projected Supply During an Average Year[1]	4,073,000	4,499,000	5,140,000	4,998,000	4,865,000
B	Projected Supply During Average of 3 Dry Year Period[1]	2,652,000	2,970,000	3,253,000	3,214,000	3,170,000
C = B/A	Projected Supply During the Average Year of a 3-Dry Year Period as a % of Average Supply	**65.1**	**66.0**	**63.3**	**64.3**	**65.2**
Demand Information						
D	Projected Demand During an Average Year[2]	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
E	Projected Demand During Average of 3-Dry Year Period [2]	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
F = E/D	Projected Demand During the Average Year of a 3-Dry Year Period as a % of Average Demand	**111.5**	**113.2**	**115.0**	**114.2**	**113.9**
Surplus Information						
G = A-D	Potential Surplus During an Average Year	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000
H = B-E	Potential Surplus During Average of 3-Dry Year Period	416,000	782,000	970,000	875,000	771,000
Additional Supply Information						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	**203.0**	**232.7**	**258.9**	**243.9**	**231.0**
J = A/E	Projected Supply During an Average Year as a % of Demand During an Average Year of a 3-Dry Year Period	**182.2**	**205.6**	**225.1**	**213.7**	**202.8**
K = B/E	Projected Supply During an Average Year of a 3-Dry Year Period as a % of an Average 3-Dry Year Demand	**118.6**	**135.7**	**142.5**	**137.4**	**132.1**

[1] Projected supplies include current supplies and supplies under development. This data was obtained from Metropolitan's November 2010 RUWMP, adopted by the Board on November 9, 2010, (Tables 2-10 and 2-11).

[2] Demand data obtained from Metropolitan's November 2010 RUWMP, adopted by the Board on November 9, 2010, (Tables 2-10 and 2-11).

Calleguas Municipal Water District Supplies and Demands

Calleguas utilized Metropolitan's water supply reliability analysis along with all of their purveyor's projections, including VCWWD No. 1, to develop their own reliability projections. In all future projection periods they also had surplus imported water projected. A copy of their projected imported water supply surpluses by year for normal, single dry and multiple dry years are shown below. It should be noted that there was a deficit shown for existing (2010) conditions but this was more than made up by the active conservation efforts of Calleguas and all of Metropolitan's retail agencies.

Table 4.2-3
Calleguas Supply versus Demand for Average Conditions

Parameter	Volume (ac-ft per year)					
	2010	2015	2020	2025	2030	2035
Average Year Demand	171,776	179,818	188,687	192,121	198,164	202,160
Average Year Local Supply	54,909	66,434	70,404	70,974	73,354	74,055
Imported Demand on MWD	116,867	113,384	118,283	121,147	124,810	128,105
Metropolitan Available Supplies	118,546	129,004	136,966	140,753	142,365	143,777
Surplus/(Deficit) as a % of Demand	1.4%	13.8%	15.8%	16.2%	14.1%	12.2%

Table 4.2-4
Calleguas Supply versus Demand for Dry Year Conditions

Parameter	Volume (ac-ft per year)					
	2010	2015	2020	2025	2030	2035
Dry Year Demand	176,548	185,960	194,699	198,843	206,556	211,547
Dry Year Local Supply	55,711	67,333	71,511	72,096	74,592	75,310
Imported Demand on MWD	120,837	118,627	123,188	126,747	131,964	136,237
Metropolitan Dry Year Allocation [1]	112,042	131,876	139,975	143,819	145,537	147,013
Surplus/(Deficit) as a % of Demand [2]	(7.3%)	11.2%	13.6%	13.5%	10.3%	7.9%

[1] Metropolitan's projected 2010 dry-year allocation in a non-shortage condition was 121,313 ac-ft. Actual allocation for 2010 was 112,042 ac-ft due to ongoing drought conditions and Bay-Delta issues.

[2] Demand management measures and cooler than normal weather helped Calleguas purveyors accommodate the reduced Metropolitan allocation.

Table 4.2-5
Calleguas Supply versus Demand for Multiple Dry Year Conditions

Parameter	Volume (ac-ft per year)					
	2010	2015	2020	2025	2030	2035
Multiple Dry Year Demand	176,728	185,654	194,330	18,448	205,556	210,205
Multiple Dry Year Local Supply	54,376	60,301	64,489	65,793	66,834	67,574
Imported Demand on Metropolitan	122,352	125,353	129,841	132,655	138,722	142,631
Metropolitan Dry Year Allocation [1]	-	131,104	139,985	145,255	148,545	149,548
Surplus/(Deficit) as a % of Demand	-	4.6%	7.8%	9.5%	7.1%	4.8%

[1] Metropolitan does not project multiple dry year supplies for the current year, only future conditions. For 2010 conditions, refer to the single dry year supply versus demand analysis.

4.3 VULNERABILITY OF WATER SUPPLY TO SEASONAL OR CLIMATIC SHORTAGE

As mentioned in Section 1, the District is located in a semi-arid coastal environment. The area must depend on imported water supplies since natural precipitation is limited and the District cannot pump enough to fully meet its needs. Climatological data in California has been recorded since the year 1858. During the twentieth century, California has experienced three periods of severe drought: 1928-34, 1976-77 and 1987-91. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by DWR. These rivers flow into the San Francisco Bay Delta and are the main source of water for the SWP. Southern California and, in particular, Ventura County, sustained few adverse impacts from the 1976-77 drought, but the 1987-91 and the 2008-2010 droughts created considerably more concern for Southern California and Ventura County.

As a result, the District is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. Response to a future drought should follow the water use efficiency mandates of the Metropolitan Water Surplus and Drought Management (WSDM) Plan, along with implementation of the appropriate stage of the District’s Water Conservation Plan. These programs are more specifically discussed in Section 8.

4.4 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS TO MEET PROJECTED WATER USE

4.4.1 Ventura County Waterworks District No. 1 Projects

The District continually reviews practices that will provide its customers with adequate and reliable supplies. Trained staff continues to ensure the water quality is safe and the water supply will meet present and future needs in an environmentally and economically responsible manner. The District consistently coordinates its long-term water shortage planning with Calleguas and FCGMA as described in other sections of this Plan.

The District projects water demand will remain relatively constant over the next 25 years due to minimal growth combined with water conservation efforts. Any new projects will be implemented to better manage and take advantage of the Las Posas Groundwater Basin resource, to increase recycled water use, and to replace or upgrade inefficient wells, rather than to support population growth and new development. Projects included in the District's Capital Improvement Program will improve the District's water supply reliability and enhance water operations. Those projects include the following:

- Moorpark Desalter – A Preliminary Design Report has been prepared. Following construction of a pilot test well, the District will perpare CEQA documents and enter into discussions with FCGMA regarding pumping South Las Posas Basin groundwater without extraction allocations, followed by final design and construction. This project will add 5,000 AFY of reliable, local supply to the District, reducing the need for imported water.
- Recycled Water Expansion – The existing tertiary treatment capacity of the Moorpark Wastewater Treatment Plant is currently 1.5 mgd. Expansion of the recycled water distribution system is planned to serve additional tertiary treated effluent from the Plant to Moorpark Country Club for golf course irrigation and to agricultural irrigation customers in that general vicinity. While this improvement is not to the domestic water system, it will enhance water supply to the District by reducing the need for imported water because the District is converting existing uses currently being served from the domestic water system to the recycled water system. This system should serve approximately 1,100 AFY of recycled water. In the future (anticipated by 2020), tertiary treatment capacity at the Moorpark Wastewater Treatment Plant is planned to be expanded to 3.0 mgd, as flows at the Plant increase and the distribution system will be expanded to serve additional customers up to approximately 1,600 AFY.
- Well No. 20 Pumps & Water Treatment Facility – Adds reliability to groundwater supply system (completed in April 2011).
- Home Acres Reservoir and Piping – Adds storage to water system.
- 994 & 1250 Pressure Zones Connection – Adds reliability to water system.
- Conversion of Chemical Feed System – Converts disinfection to chloramines for Well Nos. 95, 96, 97 & 98 to match imported water disinfection method.
- Well Nos. 95 & 98 Water Treatment Facility – Enhance water quality of these sources of supply.
- 1.0 MG 944 Zone Reservoir – Add storage to water system.
- Overall Water System Improvements – Includes replacement of pressure regulating stations and pipeline additions/replacements to enhance system operations and reliability.

4.4.2 Regional Agency Projects

Since the District purchases imported water from the SWP from Metropolitan, via Calleguas, the projects implemented by Metropolitan to secure their water supplies have a direct effect on the District. In addition, Calleguas' and FCGMA's planned projects and groundwater and recycled water programs also benefit the District.

Metropolitan Water District of Southern California (Metropolitan)

Metropolitan is implementing water supply alternative strategies for the region and on behalf of their member agencies to ensure available water in the future. Some of the strategies identified in Metropolitan's 2010 UWMP and referenced in previous sections of this Plan include:

- Conservation
- Water recycling and groundwater recovery
- Storage and groundwater management programs within the Southern California region
- Storage programs related to the SWP and the Colorado River
- Other water supply management programs outside of the region

These programs and strategies are discussed in further detail below.

Conservation Target

Metropolitan's conservation policies and practices are shaped by its Integrated Resource Plan and the California Urban Water Conservation Council (CUWCC) *Memorandum of Understanding Regarding Water Conservation in California*.

Recycled Water, Groundwater Recovery, and Desalination Target

Metropolitan supports the use of alternative water supplies such as recycled water and degraded groundwater when there is a regional benefit to offset imported water supplies. Currently, about 335 TAF per year of recycled water is permitted for use within Metropolitan's service area. Recycled uses include irrigation, commercial and industrial, seawater intrusion barriers, and groundwater recharge applications. Metropolitan estimates that an additional 458 TAF per year of new recycled water usage can be developed by 2035 with a total potential recycled water usage of 1.0 MAF by 2050. Most of the current recycled usage is for irrigation, groundwater replenishment and seawater barriers, with smaller amounts used in industrial applications.

Metropolitan recognizes the importance of member agencies developing local supplies and has implemented several programs to provide financial assistance. Metropolitan's incentive programs include:

- *Competitive LRP*: Supports the development of cost-effective water recycling and groundwater recovery projects that reduce demands for imported supplies.
- *Seawater Desalination Program (SDP)*: Supports the development of seawater desalination within Metropolitan's service area. Additional information on the SDP program is included later in this section.

Regional Groundwater Conjunctive Use Target

Other programs within Metropolitan, which are aimed at maximizing water supplies, include storage and groundwater management programs. The Integrated Resource Plan Update identified the need for dry-year storage within surface water reservoirs and the need for groundwater storage. In 2002, Diamond Valley Lake reached its full storage capacity of 800,000 AF. Approximately 400,000 AF of this total is dedicated for dry-year storage. Metropolitan has also developed a number of local programs to increase storage in the groundwater basins. The programs include:

- *Las Posas Basin*: In 1995, Metropolitan and Calleguas Municipal Water District developed facilities for groundwater storage and extraction from the Las Posas Basin. Calleguas recently took over this program from Metropolitan who had the right to store up to 210,000 AF of water in this basin with expected yields of approximately 47,000 AF of groundwater from the basin each year.
- *Proposition 13 Projects*: In 2000, DWR selected Metropolitan to receive financial funding to help fund the Southern California Water Supply Reliability Projects Program. The program coordinates eight conjunctive use projects with a total storage capacity of 195 TAF and a dry-year yield of 65 TAF per year.
- *Raymond Basin*: In January 2000, Metropolitan entered into agreements with the City of Pasadena and Foothill Municipal Water District to implement a groundwater storage program anticipated to yield 22 TAF per year by 2010.
- *Other Programs*: Metropolitan intends to expand the conjunctive use programs to add another 80 TAF to groundwater storage. Other basins in the area are being evaluated for possible conjunctive use projects.

State Water Project Target

The major actions Metropolitan is completing to improve SWP reliability include the following previously referenced programs:

- Sacramento Valley Water Management Agreement (Phase 8 Settlement)
- Monterey Amendment
- SWP Terminal Storage
- Yuba Dry-year Water Purchase Program
- DWCV SWP Table A Transfer

- DWCV Advance Delivery Program
- DWCV Other SWP Deliveries

Colorado River Aqueduct (CRA) Target

Metropolitan also receives imported water from the CRA. Metropolitan, Imperial IID and Coachella Valley Water District (CVWD) executed the Quantification Settlement Agreement (QSA) in October 2003. The QSA established the baseline water use for each agency and facilitated the transfer of agricultural water to urban uses. A number of programs have been identified to assist Metropolitan meet their target goal of 1.2 MAF per year from the CRA. The following information on these programs has been extracted from the Metropolitan's 2010 Regional UWMP:

- *Imperial Irrigation District / Metropolitan Water District Conservation Program:* Under a 1988 agreement, Metropolitan has funded water efficiency improvements within IID's service area in return for the right to divert the water conserved by those investments. Under this program, IID implemented a number of structural and nonstructural measures, including the lining of existing earthen canals with concrete, constructing local reservoirs and spill interceptor canals, installing non-leak gates, and automating the distribution system. Other implemented programs include the delivery of water to farmers on a 12-hour rather than a 24-hour basis and improvements in on-farm water management through the installation of tailwater pumpback systems, and drip irrigation systems. Through this program, Metropolitan obtained an additional 105 TAF per year, on average upon completion of program implementation. Execution of the QSA and amendments to the 1988 and 1989 agreements resulted in changes in the availability of water under the program, extending the term to 2078 if the term of the QSA extends through 2077 and guaranteeing Metropolitan at least 85 TAF per year. The remainder of the conserved water is available to CVWD.
- *Palo Verde Land Management, Crop Rotation, and Water Supply Program*: In May 2004, Metropolitan's Board authorized a 35-year land management, crop rotation, and water supply program with PVID. Under the program, participating farmers in PVID are paid to reduce their water use by not irrigating a portion of their land. A maximum of 29 percent of the lands within the Palo Verde Valley can be fallowed in any given year. Under the terms of the QSA, water savings within the PVID service area are made available to Metropolitan. This program provides up to 133 TAF of water available to Metropolitan in certain years, and a minimum of 33 TAF per year. As previously noted, in 2005, 2006, 2007, 2008, and 2009 approximately 108.7, 105.0, 72.3, 94.3, and 102.2 TAF of water, respectively, were saved and made available to Metropolitan. In March 2009, Metropolitan and PVID entered into a one-year supplemental fallowing program within PVID that provides for the fallowing of additional acreage, with savings projected to be as much as 62 TAF. Of that total, 24.1 TAF of water was saved in 2009, with the balance to be made available in 2010.

- *Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement*: Southern Nevada Water Authority (SNWA) has undertaken extraordinary water conservation measures to maintain its consumptive use within Nevada's basic apportionment of 300 TAF. The success of the conservation program has resulted in unused basic apportionment for Nevada. As SNWA expressed interest in storing a portion of the water with Metropolitan, the agencies along with the United States and the Colorado River Commission of Nevada entered into a storage and interstate release agreement in October 2004. Under the agreement, additional Colorado River water supplies are made available to Metropolitan when there is space available in the CRA to receive the water. Metropolitan has received 70 TAF through 2009. SNWA may call on Metropolitan to reduce its Colorado River water order to return this water no earlier than 2019, unless Metropolitan agrees otherwise.

- *Lower Colorado Water Supply Project*: In March 2007, Metropolitan, the City of Needles, and the USBR executed a Lower Colorado Water Supply Project contract. Under the contract, Metropolitan receives, on an annual basis, Lower Colorado Water Supply Project water unused by Needles and other entities with no rights or insufficient rights to use of Colorado River water in California, the beneficiaries of the project. A portion of the payments made by Metropolitan to Needles are placed in a trust fund for potentially acquiring a new water supply for Needles and other users of the Project should the groundwater pumped from the project's wells become too saline for use. In 2009, Metropolitan received 2.3 TAF from this project.

- *Lake Mead Storage Program*: In May 2006, Metropolitan and the USBR executed an agreement for a demonstration program that allowed the agency to leave conserved water in Lake Mead that would otherwise have been used in 2006 and 2007. USBR would normally make unused water available to other Colorado River water users, so the program included a provision that water left in Lake Mead must be conserved through extraordinary conservation measures and not simply be water that was not needed by Metropolitan in the year it was stored. This extraordinary conservation was accomplished through savings realized under the Palo Verde Land Management, Crop Rotation, and Water Supply Program. Through the two-year demonstration program, Metropolitan created 44.8 TAF of "Intentionally Created Surplus" (ICS) water. In December 2007, Metropolitan entered into agreements to set forth the rules under which ICS water is developed, and stored in and delivered from Lake Mead. The amount of water stored in Lake Mead, created through extraordinary conservation, that is available for delivery in a subsequent year is reduced by a one-time deduction of five percent, resulting in additional system water in storage in the lake, and an annual evaporation loss, beginning in the year following the year the water is stored. Metropolitan created 55.8 TAF of ICS water through the Palo Verde Land Management, Crop Rotation, and Water Supply Program in 2009.

As of January 1, 2010, Metropolitan had a total of 79.8 TAF of Extraordinary Conservation ICS water in Lake Mead. The December 2007 federal guidelines concerning the operation of the Colorado River system reservoirs provided the ability for agencies to create "System Efficiency ICS" through the development and funding of system efficiency projects that save water that would otherwise be lost from the Colorado River. To that end, in 2008 the Central Arizona Water Conservation District (CAWCD), SNWA, and Metropolitan contributed funds for the construction of the Drop 2 Reservoir by the USBR. The purpose of the Drop 2 Reservoir is to increase the capacity to regulate deliveries of Colorado River water at Imperial Dam reducing the amount of excess flow downstream of the dam by approximately 70 TAF annually. In return for its $28.7 million contribution toward construction, 100 TAF of water that remains stored in Lake Mead was assigned to Metropolitan as System Efficiency ICS. As of January 1, 2010, Metropolitan had 66 TAF of System Efficiency ICS water in Lake Mead.

In 2009, Metropolitan entered into an agreement with the United States, SNWA, the Colorado River Commission of Nevada, and CAWCD to have USBR conduct a one-year pilot operation of the Yuma Desalting Plant at one-third capacity. The pilot operation began in May 2010 and is providing data for future decision making regarding long-term operation of the Plant and developing a near-term water supply. Metropolitan's contribution toward plant operating costs is expected to secure 23.2 TAF of System Efficiency ICS by 2011.

- *Hayfield Groundwater Storage Program*: The Hayfield Groundwater Storage Program will allow CRA water to be stored in the Hayfield Groundwater Basin in east Riverside County (about 50 miles east of Palm Springs) for future withdrawal and delivery to the CRA. In June 2000, the Metropolitan Board approved the implementation of the Hayfield program and authorized storage of 800 TAF of CRA supplies when available. As of 2003, there were over 70 TAF in storage. At that time, construction of facilities for extracting the stored water began, but it was then deferred because drought conditions in the Colorado River watershed resulted in a lack of surplus supplies for storage. A prototype well was completed in August 2009. Hydrogeologic investigations indicate that conversion of the prototype well into a production well could extract as much as 5 TAF per year of previously stored water. When water supplies become more plentiful, Metropolitan may pursue this program and develop storage capacity of about 400 TAF.

CVP/SWP Storage and Transfers Target

Metropolitan has focused on voluntary short and long-term transfer and storage programs with CVP and other SWP contractors. These previously referenced programs include:

- Semitropic Storage Program
- Arvin-Edison Storage Program

- San Bernardino Valley Metropolitan Storage Program
- Kern-Delta Water District Storage Program
- Mojave Storage Program
- Central Valley Transfer Programs

Metropolitan's 2010 Regional UWMP indicates these programs can supply 402,000 AFY, 306,000 AFY and 274,000 AFY in average, single dry and multiple dry years, respectively in the year 2030.[33]

Calleguas Municipal Water District (Calleguas) Projects

Calleguas has focused its planning efforts on using existing supplies more efficiently and maximizing local water resources. Working cooperatively with local agencies, Calleguas supports a number of local recycling and groundwater recovery projects to offset increasing imported water demands. The following projects include a combination of wastewater reclamation, brackish groundwater recovery, and regional salinity management programs. It is important to note that the effect of each of these projects on groundwater resources and environmental compliance must be evaluated and approved before they can be implemented.

- ***Regional Recycling Projects***: Calleguas is working with local agencies to implement various water recycling projects. As discussed previously, recycled wastewater is used for beneficial use applications including agricultural and non-agricultural irrigation, industrial use, and groundwater recharge.
    - *Camarillo Recycled Water* – A portion of the treated effluent from the Camarillo WRP is pumped to Smith Ranch for irrigation of non-food crops. Approximately 500 AFY or recycled water is projected to be beneficially used in 2015 and beyond. In addition, Camarillo Sanitary District has agreements with Camrosa Water District that allow for delivery of tertiary treated recycled water to Camrosa.
    - *Camrosa Water District Recycled Water* – Camrosa Water District is involved in three recycled water projects: the Camrosa WRF, the Camarillo Water Reclamation Plant and the CCDP. The Camrosa WRF treats wastewater to tertiary levels and then distributes it through a recycled water distribution system for use in landscape irrigation. Approximately 980 AFY of recycled water are projected to be beneficially used from the Camrosa WRF in 2010 with that amount increasing to 2,000 AFY by 2015.

      The Camrosa Water District and the Camarillo Sanitary District have entered into an agreement to allow for delivery of tertiary treated wastewater to Camrosa from Camarillo. As previously explained, Camrosa also receives recycled water from CCDP. When Camrosa cannot use all of the CCDP water, it is delivered to Pleasant Valley County Water District in exchange for

[33] Metropolitan's 2010 Regional UWMP, Table 3-3

groundwater credits. The groundwater is pumped by United Water Conservation District for use by Oxnard and Port Hueneme as a local supply.

- *Lake Sherwood/Oak Park Recycled Water* – Triunfo Sanitation District/Las Virgines Municipal Water District jointly own and operate the Tapia WRF. Approximately 1,450 AFY of recycled water produced from this facility is imprted into the Calleguas service area and distributed to recycled water customers in Lake Sherwood, Oak Park and North Ranch through agreements between Calleguas, Triunfo, and Las Virgenes.
- *Oxnard GREAT Program* – The City of Oxnard is implementing the GREAT Program, which includes an AWPF consisting of reverse osmosis and advanced oxidation. A portion of the flow from the AWPF will be distributed to meet water demands for irrigation and industrial processes. Approximately 2,700 AFY of recycled water from the GREAT Program is projected to be directly used as recycled water by 2015, increasing to approximately 7,000 AFY by 2035.
- *Simi Valley Water Quality Control Plant* – The Simi Valley Water Quality Control Plant treats wastewater to tertiary standards. The majority of the water is discharged to the Arroyo Simi, however between 60 and 100 AFY is used for dust control and irrigation at the Simi Valley Landfill. The water discharged to the Arroyo Simi ultimately recharges downstream groundwater basins. Pending regulatory approvals, this water could be available to other downstream Calleguas purveyors who could capture the water with groundwater extraction and treatment systems.
- *VCWWD No. 1 Reclaimed Water Distribution System Expansion* – This project was discussed under the District Projects section, above. It currently serves approximately 450 AFY, is anticipated to increase to 1,100 AFY prior to 2015, and 1,600 AFY prior to 2020.

- ***Calleguas Salinity Management Pipeline:*** Calleguas, working with other agencies and stakeholders, initiated the Salinity Management Pipeline (SMP) Project. Currently under construction, the SMP consists of a pipeline system to collect treated wastewater and brine concentrates from municipal WWTPs, groundwater treatment facilities (both municipal and agricultural), industrial operations located within the Calleguas Creek watershed. Water discharged into the SMP will be conveyed to other areas where it can be utilized by agricultural users and possibly for wetland applications. Any remaining water will be discharged into the ocean through an ocean outfall. Operation of the facilities will allow for the use of poor quality water that was previously underutilized and will substantially reduce the amount of salts released into the watershed. Over time, this will reduce salt concentrations in surface water and groundwater within the watershed.

  The alignment of the SMP has been strategically located so that it can receive reverse osmosis concentrate from future brackish groundwater recover facilities as well as effluent from wastewater treatment facilities. Providing a means of disposal of brine waste from the proposed groundwater recovery facilities allows for increased use of a previously underutilized water supply and could ultimately remove an estimated 42,300 tons of salt per year from the watershed. The following sections provide descriptions of anticipated future brackish groundwater recovery projects.

- ***Brackish Groundwater Recovery Projects;*** Water imported by Calleguas and delivered to Calleguas purveyors that is not fully consumed is collected in local sanitary systems and treated at the local wastewater treatment facilities in the area. There are numerous locations within the Calleguas Creek water shed where discharged treated wastewater recharges the local groundwater basins. Much of this groundwater has relatively high dissolved solids and chloride concentrations, which requires that the water be treated with reverse osmosis. The primary purpose of the brackish groundwater recovery projects is to recover this groundwater of poor water quality, thereby increasing the availability and reliability of the region's local water supply.
    - *Moorpark Desalter* – This project is described above under District projects and is estimated to produce 5,000 AFY of high quality potable water prior to 2015 and 10,000 AFY by 2020 and beyond. Reverse osmosis brine concentrate from this proposed desalter would be discharged to the SMP and the potable water would be distributed by the District.
    - *Round Mountain Desalter* –Camrosa Water District plans to construct the Round Mountain Desalter to treat local brackish groundwater using reverse osmosis. Groundwater to be treated at the Round Mountain Desalter will be pumped from an existing well on California State University Channel Islands property in Camarillo. The Round Mountain Desalter will produce about 1,000 AFY of potable water.
    - *Camarillo Desalter* – Similar to the Moorpark Desalter, the Camarillo Desalter would pump and treat brackish groundwater for potable water use and discharge reverse osmosis concentrate to the SMP. A Pilot Study report dated January 2009 indicates that up to 7,000 AFY of high quality potable water could be produced at this location on a sustainable basis. Water produced from this facilty would be conveyed to nearby City of Camarillo distribution pipelines and also to nearby Calleguas transmission pipelines for delivery to other Calleguas purveyors.
    - *Other Potential Regional Desalters* – Other regional desalters are being considered and are in various stages of investigation, including desalters owned and operated by the agricultural community. Because these desalters are in the preliminary stages of investigation, potential local supplies produced from these facilities are not included in the local supply projections. However, as the projects become better defined, supplies from these facilities will be included, as appropriate.

- ***Watershed Management Plans:*** There are numerous on-going efforts to protect and improve the water quality within the Calleguas Creek watershed and enhance local water supplies. Information on water projects under consideration by the region, but not specifically discussed herein, can be found in the following tow documents:
  - *Calleguas Creek Watershed Management Plan, 2004*
  - *Integrated Regional Water Management Plan for the Watershed Coalition of Ventura County, 2006*

  Projects presented in these two documents may yield new local supplies to Calleguas purveyors. As these projects are further advanced, local supply projections will be updated appropriately.

4.5 EXCHANGE OR TRANSFER OPPORTUNITIES

The District has not entered into any agreements for the transfer or exchange of water other than through Calleguas. However, Metropolitan is exploring options that would benefit the region. These exchanges were discussed earlier under proposed projects for the region.

4.6 DESALINATED WATER OPPORTUNITIES

Seawater desalination represents a significant opportunity to diversify the region's water resource mix with a new, locally controlled, reliable potable supply. Like conservation, recycling, and other new local supplies, seawater desalination will increase regional supply reliability by offsetting existing and future demands for imported water.

Regional Desalination Projects Supported by Metropolitan

As noted in its 2010 Regional UWMP, Metropolitan continues to pursue a target for seawater desalination of 150,000 AFY by 2025, and several local and retail water agencies have identified seawater desalination as an important component of their water supply portfolio in their Urban Water Management Plans.

The implementation of large-scale seawater desalination plants in California offers many opportunities and challenges. In the past decade, advances in energy efficiency and membrane technology have reduced the cost of seawater desalination relative to the costs for imported water supplies and other supply alternatives. Challenges to seawater desalination include high capital and operation costs, pre-treatment design, addressing environmental issues, system integration, and navigating an uncertain permitting process. Metropolitan's member agencies are actively pursuing research into alternative intake and outfall technologies, process designs, and treatment alternatives, which could minimize some of the environmental issues and lower unit costs.

Metropolitan has encouraged the development of seawater desalination projects since it created the Seawater Desalination Program (SDP) in 2001. Metropolitan currently has four ongoing SDP agreements in place with a fifth one on hold. These five SDP projects, as well as three additional potential desalination projects within Metropolitan's service area, are summarized in Table 4.6-1.

Of the projects listed in Table 4.6-1, the Carlsbad Seawater Desalination project is the farthest along, having obtained all the necessary local, State and Federal permits required to begin construction. However, some legal challenges to these permits surfaced in 2010. Nevertheless, project proponents are hopeful this project can come on-line as early as 2012.

Metropolitan promotes the development of local seawater desalination projects by providing regional facilitation, supporting member agency projects during permit hearings and other proceedings, coordinating responses to potential legislation and regulations, and working with the member agencies to resolve related issues such as greenhouse gas emission standards and seawater intake regulations, which could impact seawater desalination projects. Metropolitan has also formed a special Board Committee to seek additional ways to promote potential projects and explore opportunities for developing regional seawater desalination supplies.

Table 4.6-1
Seawater Desalination Program (SDP) and Potential Project Status

Project	Member Agency Service Area	Annual Capacity (AFY)	Status
Long Beach Seawater Desalination Project	Long Beach Water Department	10,000	Pilot Study (SDP Agreement)
South Orange Coastal Ocean Desalination Project	Municipal Water District of Orange County	16,000-28,000	Pilot Study (SDP Agreement)
Carlsbad Seawater Desalination Project	San Diego County Water Authority	56,000	Permitting (SDP Agreement)
West Basin Seawater Desalination Project	West Basin Municipal Water District	20,000	Pilot Study (SDP Agreement)
Total SDP Desalination Projects		***102,000-114,000***	
Los Angeles DWP Desalination Project	Los Angeles DWP	28,000	On-Hold
Huntington Beach Seawater Desalination Project	Municipal Water District of Orange County	56,000	Permitting
Camp Pendleton Seawater Desalination Project	San Diego County Water Authority	56,000-168,000	Planning
Rosarito Beach Seawater Desalination Feasibility Study	San Diego County Water Authority	28,000-56,000	Feasibility Study
Total Additional Potential Desalination Projects		***168,000-308,000***	

Statewide Desalination Projects Supported by the DWR

As noted on DWR's website[34], in November 2002, California voters passed Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002. Chapter 6(a) of Proposition 50 allocated the sum of $50 million for grants for brackish water and ocean water desalination projects. This grant program, administered by DWR, aimed to assist local public agencies in the development of new local water supplies through the construction of brackish water and ocean water desalination projects. The program also aimed to help advance water desalination technology and its use by means of feasibility studies, research and development, and pilot and demonstration projects. Two rounds of funding were conducted (2004 and 2006) under this grant program, which resulted in the investment of about $50 million to support 48 desalination projects. These projects included seven construction projects, 14 research and development projects, 15 pilot plants and demonstration projects, and 12 feasibility studies.

The California Legislature also approved Assembly Bill 2717, which asked DWR to convene the California Water Desalination Task Force to investigate potential opportunities and impediments for using seawater and brackish water desalination, and to examine what role, if any, the State should play in furthering the use of desalination technology. A primary finding of the Task Force was that economically and environmentally acceptable desalination should be considered as part of a balanced water portfolio to help meet California's existing and future water supply and environmental needs. The Task Force arrived at 41 key findings and made 29 major recommendations relating to seawater and brackish water desalination.[35]

[34] DWR's desalination website can be accessed at this link: http://www.water.ca.gov/desalination/
[35] A complete listing of the Task Force Report's findings and recommendations is available at this website: http://www.water.ca.gov/desalination/pud_pdf/Findings-Recommendations.pdf

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5 WATER SUPPLY BASELINES AND TARGETS AND WATER SUPPLY RELIABILITY COMPARISON TABLES

5.1 WATER BASELINES AND TARGETS

To comply with the SBX7-7 water conservation legislation, water suppliers must first establish a baseline water usage, which is then used to set targets for 2015 and 2020. The SBX7-7 legislation stipulates that targets must be established by using one of four allowable methods briefly defined as follows:

- Method 1: Per capita daily use equals eighty percent of the water supplier's baseline per capita usage;
- Method 2: Per capita daily use is set based on performance standards applied to indoor residential use; landscape area water use, and commercial, industrial and institutional use;
- Method 3: Per capita daily use is set at 95 percent of the applicable State hydrologic region target based on DWR's April 30, 2011 draft 20x2020 Water Conservation Plan (VCWWD No. 1 is in the South Coast Region 4); and
- Method 4: Per capita daily use is set based on standards consistent with CUWCC BMPs

Detailed information on the calculation of the District's baseline water usage and 2015 and 2020 per capita water conservation targets can be found in Appendix E, a Technical Memorandum dated April 22, 2011, entitled "20x2020 Baseline Calculation & Water Use Target Method Selection.

As noted in Appendix E, the District's per capita usage baseline average, minimum baseline average and SBX7-7 water conservation targets for 2015 and 2020 have been established as follows:

- Baseline Average (based on 10-year data from 2000-2009) = 239.8 gpcd
- Minimum Baseline Average (based on 5-year data from 2004-2008) = 239.6 gpcd
- 2015 Water Conservation Target = 215.8 gpcd
- 2020 Water Conservation Target = 191.8 gpcd

Method 1 is the most favorable for the District and will be utilized by the District in tracking progress toward target compliance.

5.2 WATER SUPPLY RELIABILITY COMPARISON TABLES

Tables 5.2-1 through 5.2-7 compare the District's anticipated available water supply with expected demands for normal, single dry and multiple dry years beginning in 2010 and extending through 2035.

Table 5.2-1
VCWWD No. 1
Projected Water Supply and Demand (AFY)
Normal Water Year

	2015	2020	2025	2030	2035
DEMAND					
Recycled Water	1,100	1,600	1,600	1,600	1,600
Total Recycled Water	**1,100**	**1,600**	**1,600**	**1,600**	**1,600**
Municipal and Industrial [1]	10,215	10,438	11,197	11,995	12,834
Agricultural [1]	2,847	2,847	2,847	2,847	2,847
Total Potable	**13,062**	**13,285**	**14,044**	**14,842**	**15,681**
TOTAL DEMAND	**14,162**	**14,885**	**15,644**	**16,442**	**17,281**
20x2020 Per Capita (GPCD) [2]	201.2	180.0	-	-	-
% of 2010 Normal Year Demand (13,447 AF)	105.3	110.7	116.3	122.3	128.5
SUPPLIES					
Recycled Water	**1,100**	**1,600**	**1,600**	**1,600**	**1,600**
Recovered Groundwater [3]	5,000	10,000	10,000	10,000	10,000
Potable Groundwater [4]	2,240	2,240	2,240	2,240	2,240
Total Potable Water	**7,240**	**12,240**	**12,240**	**12,240**	**12,240**
TOTAL LOCAL SUPPLIES	**8,340**	**13,840**	**13,840**	**13,840**	**13,840**
Imported Supply Required	5,822	1,045	1,804	2,602	3,441
Imported Calleguas Supply Programmed [5]	5,515	6,238	6,997	7,795	8,634
Imported Supply Surplus/(Deficit) as a % of Demand [6]	13.8%	15.8%	16.2%	14.1%	12.2%
IMPORT SUPPLY AVAILABLE [7]	**6,275**	**7,223**	**8,129**	**8,891**	**9,690**
TOTAL SUPPLY	**14,615**	**21,063**	**21,969**	**22,731**	**23,530**
Supply/Demand Surplus	**453**	**6,178**	**6,325**	**6,289**	**6,249**
Difference as a % of Supply	**3.1%**	**29.3%**	**28.8%**	**27.7%**	**26.6%**
Difference as a % of Demand	**3.2%**	**41.5%**	**40.4%**	**38.3%**	**36.2%**

[1] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were adjusted to exclude recycled water reported on the first row. Municipal and Industrial: Existing 450 AFY and Proposed by 2015 350 AFY (Moorpark Country Club Golf Course); Agricultural: Proposed by 2015 300 AFY. An Additional 500 AFY of recycled **water** will come on line between 2015 and 2020 reducing Municipal and Industrial Demand accordingly.

[2] Total Potable Water Demand minus Agricultural and Recycled Water divided by Population (from Table 1.3-2)

[3] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were adjusted to include an additional proposed 5,000 AFY by 2020. The amount and timing of the Recovered Groundwater shown is subject to an on-going study regarding the impacts of the project on the groundwater basin, subsequent agreement with FCGMA, and Calleguas' completion of the SMP to Moorpark. If these projected volumes are not achieved, imported water would be increased to make up the difference between the amount projected and that achieved (see row titled Supply/Demand Surplus, above).

[4] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were reduced to 2,240 AFY per VCWWD's projections.

[5] Per Calleguas 2010 UWMP, Appendix C

[6] Calleguas Imported Surplus/(Deficit) as a % of Imported Demand, from Table 4.2-3

[7] Imported Calleguas Supply Programmed x (1 + Imported Supply Surplus (Deficit) as a % of Imported Demand)

Table 5.2-2
VCWWD No. 1
Projected Water Supply and Demand
Single Dry Water Year (AFY)

	2015	2020	2025	2030	2035
DEMAND					
Recycled Water	1,100	1,600	1,600	1,600	1,600
Total Recycled Water	**1,100**	**1,600**	**1,600**	**1,600**	**1,600**
Municipal and Industrial [1]	12,165	12,268	12,642	14,116	15,063
Agricultural [1]	2,847	2,847	2,847	2,847	2,847
Total Potable Water	**15,012**	**15,115**	**15,489**	**16,963**	**17,910**
TOTAL DEMAND	**16,112**	**16,715**	**17,089**	**18,563**	**19,510**
% of 2010 Normal Year Demand (13,447 AF)	**119.8**	**124.3**	**127.1**	**138.0**	**145.1**
SUPPLIES					
Recycled Water	**1,100**	**1,600**	**1,600**	**1,600**	**1,600**
Recovered Groundwater [2]	5,000	10,000	10,000	10,000	10,000
Potable Groundwater [3]	2,240	2,240	2,240	2,240	2,240
Total Potable Water	**7,240**	**12,240**	**12,240**	**12,240**	**12,240**
TOTAL LOCAL SUPPLIES	**8,340**	**13,840**	**13,840**	**13,840**	**13,840**
Imported Supply Required	7,772	2,875	3,249	4,723	5,670
Imported Calleguas Supply Programmed [4]	7,465	8,068	8,442	9,916	10,863
Imported Supply Surplus/(Deficit) as a % of Demand [5]	11.2%	13.6%	13.5%	10.3%	7.9%
IMPORT SUPPLY AVAILABLE [6]	**8,299**	**9,167**	**9,579**	**10,936**	**11,722**
TOTAL SUPPLY	**16,639**	**23,007**	**23,419**	**24,776**	**25,562**
Supply/Demand Surplus	**527**	**6,292**	**6,330**	**6,213**	**6,052**
Difference as a % of Supply	**3.2%**	**27.3%**	**27.0%**	**25.1%**	**23.7%**
Difference as a % of Demand	**3.3%**	**37.6%**	**37.0%**	**33.5%**	**31.0%**

[1] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were adjusted to exclude recycled water reported on the first row. Municipal and Industrial: Existing 450 AFY and Proposed by 2015 350 AFY (Moorpark Country Club Golf Course); Agricultural: Proposed by 2015 300 AFY. An Additional 500 AFY of recycled water will come on line between 2015 and 2020 reducing Municipal and Industrial Demand accordingly.

[2] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were adjusted to include an additional proposed 5,000 AFY by 2020. The amount and timing of the Recovered Groundwater shown is subject to an on-going study regarding the impacts of the project on the groundwater basin, subsequent agreement with FCGMA, and Calleguas' completion of the SMP to Moorpark. If these projected volumes are not achieved, imported water would be increased to make up the difference between the amount projected and that achieved (see row titled Supply/Demand Surplus, above).

[3] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were reduced to 2,240 AFY per VCWWD's projections.

[4] Per Calleguas 2010 UWMP, Appendix C

[5] Calleguas Imported Surplus/(Deficit) as a % of Imported Demand, from Table 4.2-4

[6] Imported Calleguas Supply Programmed x (1 + Imported Supply Surplus (Deficit) as a % of Imported Demand)

Table 5.2-3
VCWWD No. 1
Projected Water Supply and Demand (AFY)
Multiple Dry Water Years

	2015	2020	2025	2030	2035
DEMAND					
Recycled Water	1,100	1,600	1,600	1,600	1,600
Total Recycled Water	**1,100**	**1,600**	**1,600**	**1,600**	**1,600**
Municipal and Industrial [1]	12,311	12,641	13,512	14,428	15,392
Agricultural [1]	2,847	2,847	2,847	2,847	2,847
Total Potable Water	**15,158**	**15,488**	**16,359**	**17,275**	**18,239**
TOTAL RETAIL DEMAND	**16,258**	**17,088**	**17,959**	**18,875**	**19,839**
% of 2010 Normal Year Demand (13,447 AF)	**120.9**	**127.1**	**133.6**	**140.4**	**147.5**
SUPPLIES					
Recycled Water	**1,100**	**1,600**	**1,600**	**1,600**	**1,600**
Recovered Groundwater [2]	5,000	10,000	10,000	10,000	10,000
Potable Groundwater [3]	2,240	2,240	2,240	2,240	2,240
Total Potable Water	**7,240**	**12,240**	**12,240**	**12,240**	**12,240**
TOTAL LOCAL SUPPLIES	**8,340**	**13,840**	**13,840**	**13,840**	**13,840**
Imported Supply Required	7,918	3,248	4,119	5,035	5,999
Imported Calleguas Supply Programmed [4]	7,638	8,468	9,339	10,255	11,219
Imported Supply Surplus/(Deficit) as a % of Demand [5]	4.6%	7.8%	9.5%	7.1%	4.8%
IMPORT SUPPLY AVAILABLE [6]	**7,988**	**9,130**	**10,226**	**10,981**	**11,763**
TOTAL RETAIL SUPPLY	**16,328**	**22,970**	**24,066**	**24,821**	**25,603**
Supply/Demand Surplus	**70**	**5,882**	**6,107**	**5,946**	**5,764**
Difference as a % of Supply	**0.4%**	**25.6%**	**25.4%**	**24.0%**	**22.5%**
Difference as a % of Demand	**0.4%**	**34.4%**	**34.0%**	**31.5%**	**29.1%**

[1] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were adjusted to exclude recycled water reported on the first row. Municipal and Industrial: Existing 450 AFY and Proposed by 2015 350 AFY (Moorpark Country Club Golf Course); Agricultural: Proposed by 2015 300 AFY. An Additional 500 AFY of recycled water will come on line between 2015 and 2020 reducing Municipal and Industrial Demand accordingly.

[2] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were adjusted to include an additional proposed 5,000 AFY by 2020. The amount and timing of the Recovered Groundwater shown is subject to an on-going study regarding the impacts of the project on the groundwater basin, subsequent agreement with FCGMA, and Calleguas' completion of the SMP to Moorpark. If these projected volumes are not achieved, imported water would be increased to make up the difference between the amount projected and that achieved (see row titled Supply/Demand Surplus, above).

[3] Numbers reported in Calleguas 2010 UWMP Update, Appendix C, were reduced to 2,240 AFY per VCWWD's projections.

[4] Per Calleguas 2010 UWMP, Appendix C

[5] Calleguas Imported Surplus/(Deficit) as a % of Imported Demand, from Table 4.2-5

[6] Imported Calleguas Supply Programmed x (1 + Imported Supply Surplus (Deficit) as a % of Imported Demand)

As shown on Table 5.2-1 for Normal Water Years, which includes projected growth, following the Total Demand row, the per capita consumption for 2020 is 180.0 gpcd, which would achieve the target goal of 181.1 gpcd; and the 2015 projection is 201.2 gpcpd, which would also achieve the target goal of 202.2 gpcd. These per capita water use figures in Table 5.2-1 subtract out agricultural water use and include the credit for the District's existing and proposed recycled water use. Demands were developed using District projections provided to Calleguas (which tend to be conservative) and then divided by the population projections from SCAG, delayed as recommended by the City of Moorpark due to economic considerations, as discussed previously. Projections also assume demands will return to pre-drought or pre-water allocation levels, when some of the water conservation achieved over the past two years will likely remain and result in a permanent reduction of demands.

Even though the target 20x2020 water conservation goals are projected to be met by the District the per capita consumption will be monitored annually to track progress and the District will also continue to pursue water conservation efforts on their own and along with Calleguas.

5.3 LOW-INCOME PROJECTED WATER DEMANDS

The California Water Code, Division 6, Part 2.6, Section 10631.1[36] requires each urban water retailer to include projected water use for single family and multi-family residential housing needed for lower income households as defined in Section 50079.5[37] of the Health and Safety Code, as identified in the housing element of the City or County the water agency serves.

Since the District's population and housing units is approximately 97 percent of the City of Moorpark, we will use the City's share of the regional housing needs for this section. The City of Moorpark's fair share for affordable housing units under the 2006-2014 Regional Housing Needs Assessment (RHNA) requirements is as shown in Table 5.3-1.[38] A new Housing Element that addresses this RHNA is under preparation by SCAG and expected to be completed in 2011.

[36] All California Law Codes can be accessed at this website: http://www.leginfo.ca.gov/calaw.html; Section 10631.1 of the California Water Code is available at this website: http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wat&group=10001-11000&file=10630-10634

[37] Section 500.79.5 of the Health and Safety Code is available at this website: http://www.leginfo.ca.gov/cgi-bin/displaycode?section=hsc&group=50001-51000&file=50050-50106

[38] City of Moorpark Housing Element, March 16, 2011.

Table 5.3-1
City of Moorpark Share of Regional Housing Needs
2006-2014 RHNA

Income Group	Number of Units	Percentage
Very Low	363	22.4%
Low	292	18.1%
Moderate	335	20.7%
High	627	38.8%
TOTAL	**1,617**	**100.0%**

As shown in Table 5.3-1, the very low and low income dwelling units total to 665 (363+292) by 2014, which are the lower income housing units subject to the new Water Code requirements described in the first paragraph of this section. According to the City's Housing Element report dated March 16, 2011, a total of 34 low income units were completed from January 2006 to December 2010, leaving a remaining need for 631 (665-34) very low and low income units. Using the 2010 residential usage of 6,676 AFY from Table 6.1-1 and the 2010 population of 38,703 from Table 1.3-2, we get an average use of 154 gpcd. Using the City-wide population per dwelling unit projected by DOF for 2010 of 3.53, these 631 dwelling units would equate to a population of approximately 2,227, which would generate a total demand of 342,958 gpd or 384 AFY at the 154 gpcd calculated above. There is more than enough increase shown in the M&I (and specifically residential) water demand increases to accommodate this increase in low income housing shown in the District's projections between 2010 and 2015. However it should be noted that the population projections provided by the City of Moorpark only show a population increase of 1,731 between 2010 and 2015, which would not include all of the 2,227 population that would be generated assuming the current people per dwelling unit factor within the City. However, there is adequate supply to meet the lower income housing needs included in the District's projections, if it is all constructed.

5.4 WATER USE REDUCTION PLAN

As demonstrated from the historical water usage data presented in Appendix E, the District has realized substantial reductions in per capita water usage in recent years. However, the District has not achieved its 2020 water conservation target in past years but did achieve its interim 2015 target of 202.2 gpcd in 2010. But since 2010 was a water allocation year for Metropolitan, the District should not rely on water allocation years to meet these targets.

The District plans to meet or exceed its SBX7-7 water conservation targets, through a variety of means including:

- Completing its current expansion of the recycled water distribution system to serve an additional 350 AFY of irrigation demands in the Moorpark Country Club golf course area and 300 AFY of agricultural irrigation customers;
- Expanding the tertiary treatment capacity of the Moorpark Wastewater Treatment Plant as flow increase to 3.0 mgd and expanding the recycled water distribution system to supply another 500 AFY of recycled water to existing M&I irrigation users by 2020;
- Encouraging residents and businesses in the District to conserve water;
- Educating the public through a variety of programs on the need for continued water conservation;
- Considering restructure of the third tier water rate to encourage increased water conservation to comply with 20x2020 targets;
- Continuing to operate and maintain the water distribution system with an eye toward maintaining current levels of water loss within AWWA standards and minimizing future losses by repairing or eliminating any leaks that may develop as soon as practical;
- Requiring new developments to install water conservation fixtures and landscape with low water use plant materials (xeriscape) pursuant to the City of Moorpark’s new landscape ordinance in compliance with State requirements;
- Looking for additional landscape areas that could be converted from the potable system to the recycled water system.

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6 WATER USE PROVISIONS

6.1 PAST, CURRENT AND PROJECTED WATER USE AMONG SECTORS

Over the past five years, new connections have been added at a rate of approximately 1.3 percent per year, which is a decline from previous years due to economic conditions. Due to new plumbing efficiency standards, landscape guidelines, and other water use efficiency programs, water demand is projected to increase at a declining rate of less than one percent per year in future years. Table 6.1-1 presents past, current and projected water use between 2005 and 2035. As shown in Table 6.1-1, water use for 2010 was down even though the number of connections increased, which can be accounted for due to the fact that it was a water allocation year due to drought conditions and above average rainfall. The fairly large increase in water use shown in Table 6.1-1 is primarily due to the fact that the future years are projected as normal years, not dry years.

Table 6.1-1
Past, Current and Projected Water Use by Billing Classification (AF)

Billing Class (Rev. Code)	Actual		Projected				
	2005	2010	2015	2020	2025	2030	2035
Residential (0)	6,716	6,676	7,807	7,979	8,566	9,182	9,831
Commercial (2)	675	697	815	833	894	959	1,026
Agricultural (3)	2,615	2,646	2,847	2,847	2,847	2,847	2,847
Institutional/Governmental (4)	766	752	879	899	965	1,034	1,107
Industrial (5)	248	171	200	204	219	235	252
Other (6,7&8) [1]	372	15	18	18	19	21	22
Subtotal	**11,392**	**10,957**	**12,566**	**12,780**	**13,510**	**14,278**	**15,085**
Unaccounted for System Losses [2]	480	369	496	505	534	564	596
Total Potable Water Use	**11,872**	**11,326**	**13,062**	**13,285**	**14,044**	**14,842**	**15,681**
Recycled Water		448	1,100	1,600	1,600	1,600	1,600
TOTAL WATER USE	**11,872**	**11,774**	**14,162**	**14,885**	**15,644**	**16,442**	**17,281**

Source: Fiscal Year 2005 and 2010 data from District production and consumption data (FY ending June 30); all future water use by billing class from Table 5.2-1 and was proportioned per FY 2010.

[1] Includes Construction, Hydrant and Fire Usage

[2] 2005 and 2010 unaccounted for losses are based on actual data; all other years based on an estimated average loss of 3.8% (average percentage loss over the past six years (FY 2005-2010))

Unaccounted-for water is the difference between water production and water consumption and represents “lost” water. Unaccounted-for water occurs for a number of reasons:

- Water lost from system leaking, i.e., from pipes, valves, pumps, and other water system appurtenances.

- The District performs hydrant testing to monitor the level of fire protection available throughout the service area. The District performs hydrant flushing to eliminate settled sediment and ensure better water quality. Hydrant testing and flushing is not metered. However, this quantity of water is estimated and taken into consideration when calculating unaccounted-for water.
- Water used by the Fire Department to fight fires. This water is not metered but is estimated and included under the "Other" category.
- Customer meter inaccuracies. Meters have an inherent accuracy for a specified flow range. However, flow above or below this range is usually registered at a lower rate. Meters become less accurate with time due to wear. To attempt to minimize these inaccuracies, the District has a meter replacement program.

Unaccounted-for water was 3.3 percent in 2009/10, and based on records for 2004/05 through 2009/10 (over the past six years), unaccounted-for water has averaged 3.8 percent.

6.2 WATER SERVICE CONNECTIONS BY SECTOR

Table 6.2-1 shows the current and projected number of water service customers by sector from 2005 through 2035.

Table 6.2-1
Number of Water Service Connections by Billing Classification

Billing Class (Rev. Code)	Actual		Projected				
	2005	2010	2015	2020	2025	2030	2035
Residential (0)	9,106	9,697	11,339	12,151	13,003	13,899	14,840
Commercial (2)	203	219	256	274	294	314	335
Agricultural (3)	171	172	172	172	172	172	172
Institutional/Governmental (4)	132	158	185	198	212	226	242
Industrial (5)	72	70	82	88	94	100	107
Other (6,7&8) [1]	235	257	301	322	345	368	393
Total Connections	**9,919**	**10,573**	**12,335**	**13,205**	**14,119**	**15,080**	**16,090**

Source: Fiscal Year 2005 and 2010 data from District production and consumption data (FY ending June 30); all future projections were proportioned per fiscal year 2010 usage per connection. Excludes recycled water connections

[1] Includes Construction, Hydrant and Fire Connections

7 WATER DEMAND MANAGEMENT MEASURES (DMM)

7.1 INTRODUCTION

On July 30, 1991, the District elected to become Signatory to the Memorandum of Understanding (MOU) Regarding Best Management Practices (BMPs) for Urban Water Conservation with the California Urban Water Conservation Council (CUWCC).

Calleguas implements many of the urban water conservation BMPs on behalf of its member agencies, including VCWWD No. 1. Calleguas' 2010 Regional Urban Water Management Plan should be referred to for a detailed discussion of each regional BMP program.

7.2 DETERMINATION OF DMM IMPLEMENTATION

As Signatory to the MOU, the District has committed to a good faith effort in implementing the 14 cost-effective BMPs. "Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in each BMP's definition, and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in the MOU. A BMP as defined in the MOU is a "practice for which sufficient data are available from existing water conservation practices to indicate that significant conservation or conservation related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water agencies to carry out."

These 14 BMPs include technologies and methodologies that have been sufficiently documented in multiple demonstration projects that result in more efficient water use and conservation. Many of the BMPs are implemented by the District in coordination with Calleguas and their regional conservation programs. Specifically, the 14 BMPs include:

1. Water survey programs for single-family residential and multifamily residential customers
2. Residential plumbing retrofit
3. System water audits, leak detection, and repair
4. Metering with commodity rates for all new connections and retrofit of existing connections
5. Large landscape conservation programs and incentives
6. High-efficiency washing machine rebate programs
7. Public information programs
8. School education programs
9. Conservation programs for commercial, industrial, and institutional accounts

10. Wholesale agency programs
11. Conservation pricing
12. Water conservation coordinator
13. Water waste prohibition
14. Residential ultra-low-flush toilet replacement programs

As signatory to the MOU, the District is responsible for completing and submitting BMP Activity Reports to the CUWCC every two years for each year prior. The District's BMP Activity Report is a comprehensive document that shows implementation of each BMP and provides a determination of implementation from the District's 2000 UWMP. The District has maintained full compliance with all the BMPs to date.

As noted in Section 1.2 of this UWMP, AB 1465 (2010), clarifies that urban water suppliers that are members of the CUWCC and comply with the provisions of the "*Memorandum of Understanding Regarding Urban Water Conservation in California*" dated December 10, 2008, as it may be amended (MOU), may submit their annual reports required under the CUWCC MOU as evidence of compliance without the need for any additional documentation in their UWMPs. With that in mind, Ventura County Waterworks District No. 1's Activity Reports for reporting years 2007-2008 and 2009-2010 are included in Appendix F as evidence of BMP compliance. These reports indicate the District is on track for meeting BMP coverage in its service area according to the MOU.

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8 WATER SHORTAGE CONTINGENCY PLAN

8.1 INTRODUCTION

California's extensive system of water supply infrastructure, its reservoirs, groundwater basins, and inter-regional conveyance facilities, mitigates the effect of short-term dry periods. Defining when a drought begins is a function of drought impacts to water users. Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Droughts occur slowly, over a multiyear period. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

8.2 STAGES OF ACTION

Ventura County Waterworks District No. 1 Water Shortage Response

To meet short-term water demand deficiencies, and short- or long-term drought requirements, the District has included a Water Shortage Plan, which is included as Section K of their Rules and Regulations. The District has also adopted permanent water conservation measures included in Section L of their Rules and Regulations. These two sections of the District's rules and regulations are included as Appendix G. In addition, the City of Moorpark which covers the majority of the District has adopted the State of California DWR's Model Water Efficient Landscape Ordinance that set forth standards for landscape irrigation during drought and non-drought times, and acknowledges the constant need to establish long-term water efficiency (City Ordinance 10-383, Chapter 15.23). This ordinance covers all landscaping within new developments as well as rehabilitated landscape.

Provisions of the District's Water Shortage Plan will be implemented in congruence with the policy of Metropolitan and Calleguas' water shortage/drought activities. Calleguas' policy will be based on Metropolitan's adopted Water Surplus and Drought Management Plan (WSDM Plan) as well as Metropolitan's Water Supply Allocation Plan as revised in June 2009. The WSDM Plan is designed to guide management of regional water supplies to achieve reliability goals for Southern California. The Water Supply Allocation Plan is designed to provide a framework for administering an allocation should a water shortage be declared.

In the event of a water shortage, the Director of the Ventura County Public Works Agency (Agency Director) is authorized and directed by to implement provisions of the Water Shortage Plan, subject to ratification by the District Board at its first regularly scheduled meeting.

The Agency Director determines the extent of conservation or water use efficiency required through the implementation and/or termination of particular conservation stages or levels consisting of three levels for the District to prudently plan for and supply water to its customers. However, in the case of local emergencies, the Director of the

Department of Water and Sanitation has the authority to order the implementation of the appropriate stage of water conservation.

Rationing Stages and Reduction Goals

To meet short-term water demand deficiencies and short- or long-term drought requirements, the District will implement its own water shortage policy in accordance with the District's Water Conservation Program and the policy of Calleguas, which is anticipated to be based on Metropolitan's Water Shortage and Drought Management (WSDM) Plan. The WSDM Plan defines the expected sequence of resource management actions Metropolitan will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. The Calleguas 2010 Regional UWMP details each of the surplus and shortage stages, actions by stage and allocation of supply for M&I demand. In addition, the District can restrict landscape and agricultural irrigation water usage. Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage, an allocation plan will be adopted in accordance with the principles of the WSDM Plan and Metropolitan's Water Supply Allocation Plan.

Metropolitan Water Surplus and Drought Management Plan

In 1999, Metropolitan in conjunction with its member agencies developed the WSDM Plan.[39] This plan addresses both surplus and shortage contingencies.

The WSDM Plan will guide management of regional water supplies to achieve the reliability goals of Southern California's IRP. The IRP sought to meet long-term supply and reliability goals for future water supply planning. The WSDM Plan's guiding principle is to minimize adverse impacts of water shortage and ensure regional reliability. From this guiding principle come the following supporting principles:

- Encourage efficient water use and economical local resource programs;
- Coordinate operations with member agencies to make as much surplus water as possible available for use in dry years;
- Pursue innovative transfers and banking programs to secure more imported water for use in dry years; and
- Increase public awareness about water supply issues.

The WSDM Plan guides the operations of water resources (local resources, Colorado River, State Water Project, and regional storage) to ensure regional reliability. It identifies the expected sequence of resource management actions Metropolitan will take during surpluses and shortages of water to minimize the probability of severe shortages

[39] A copy of Metropolitan's WSDM Plan can be found in Appendix A.4 to the agencies November 2010 RUWMP at: http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf

that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable; however, in the event of an extreme shortage Metropolitan's Water Supply Allocation Plan will be implemented.

The WSDM Plan distinguishes between *Surpluses*, *Shortages*, *Severe Shortages*, and *Extreme Shortages.* Within the WSDM Plan, these terms have specific meaning relating to Metropolitan's capability to deliver water to the District as described below:

- **Surplus:** Metropolitan can meet full-service and interruptible program demands, and it can deliver water to local and regional storage.
- **Shortage:** Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.
- **Severe Shortage:** Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation. In a Severe Shortage, Metropolitan may have to curtail Interim Agricultural Water Program (IAWP) deliveries in accordance with IAWP.
- **Extreme Shortage:** Metropolitan must allocate available supply to full-service customers.

The WSDM Plan also defines five surplus management stages and seven shortage management stages to guide resource management activities. Each year, Metropolitan will consider the level of supplies available and the existing levels of water in storage to determine the appropriate management stage for that year. Each stage is associated with specific resource management actions designed to: 1) avoid an Extreme Shortage to the maximum extent possible; and 2) minimize adverse impacts to retail customers should an "Extreme Shortage" occur. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix. This sequencing may change as the resource mix evolves.

WSDM Plan Shortage Actions by Shortage Stage

When Metropolitan must make net withdrawals from storage, it is considered to be in a shortage condition. However, under most of these stages, it is still able to meet all end-use demands for water. The following summaries describe water management actions to be taken under each of the seven shortage stages.

- **Shortage Stage 1** – Metropolitan may make withdrawals from Diamond Valley Lake.
- **Shortage Stage 2** – Metropolitan will continue Shortage Stage 1 actions and may draw from out-of-region groundwater storage.
- **Shortage Stage 3** – Metropolitan will continue Shortage Stage 2 actions and may curtail or temporarily suspend deliveries to Long Term Seasonal and Replenishment Programs in accordance with their discounted rates.

- **Shortage Stage 4** – Metropolitan will continue Shortage Stage 3 actions and may draw from conjunctive use groundwater storage (such as the North Las Posas program) and the SWP terminal reservoirs.
- **Shortage Stage 5** – Metropolitan will continue Shortage Stage 4 actions. Metropolitan's Board of Directors may call for extraordinary conservation through a coordinated outreach effort and may curtail Interim Agricultural Water Program deliveries in accordance with their discounted rates. In the event of a call for extraordinary conservation, Metropolitan's Drought Program Officer will coordinate public information activities with member agencies and monitor the effectiveness of ongoing conservation programs. The Drought Program Officer will implement monthly reporting on conservation program activities and progress and will provide quarterly estimates of conservation water savings.
- **Shortage Stage 6** – Metropolitan will continue Shortage Stage 5 actions and may exercise any and all water supply option contracts and/or buy water on the open market either for consumptive use or for delivery to regional storage facilities for use during the shortage.
- **Shortage Stage 7** – Metropolitan will discontinue deliveries to regional storage facilities, except on a regulatory or seasonal basis, continue extraordinary conservation efforts, and implement its Water Supply Allocation Plan.

The overriding goal of the WSDM Plan is to never reach Shortage Stage 7, an Extreme Shortage.

Reliability Modeling of the WSDM Plan

Using a technique known as "sequentially indexed Monte Carlo simulation," Metropolitan undertook an extensive analysis of system reservoirs, forecasted demands, and probable hydrologic conditions to estimate the likelihood of reaching each Shortage Stage through 2010. The results of this analysis demonstrated the benefits of coordinated management of regional supply and storage resources. Expected occurrence of a Severe Shortage is four percent or less in most years and never exceeded six percent; equating to an expected shortage occurring once every 17 to 25 years. An Extreme Shortage was avoided in every simulation run.

Metropolitan's Water Supply Allocation Plan[40]

Metropolitan adopted its Water Supply Allocation Plan (WSAP) following critically dry conditions affected all of Metropolitan's main supply sources in 2007. Those dry conditions coupled with a ruling in the Federal Courts in August 2007 providing protective measures for the Delta smelt in the Sacramento-San Joaquin River Delta, brought uncertainty about future pumping operations from the State Water Project.

[40] Information presented in this section has been extracted from Metropolitan's Water Supply Allocation Plan, June 2009, a copy of which can be found in Appendix A.4 to the agencies November 2010 RUWMP at: http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf

Metropolitan's WSAP is described below and was put into effect for the first time in FY 2010 and 2011 calling for an allocation of imported supply to all of Metropolitan's member agencies. Due to the favorable weather conditions brought on by the winter of 2011, Metropolitan's Board of Directors rescinded the allocation on April 12, 2011 following Governor Brown's announcement of the end of California's drought.

Metropolitan worked jointly with the member agency managers and staff to develop a Water Supply Allocation Plan (Plan) to address such needs. The plan that was eventually adopted includes specific formulas for calculating member agency supply allocations and the key implementation elements needed for administering an allocation should a shortage be declared. The adopted allocation formulas seek to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level, and takes into account growth, local investments, changes in supply conditions and the beneficial impacts of non-potable recycled water use and the implementation of conservation savings programs. The adopted formulas are calculated in three steps: (1) base period calculations; (2) allocation year calculations, and (3) supply allocation calculations. These steps are described in further detail below.

- <u>Step 1: Base Period Calculations</u>: The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the three most recent non-shortage years (base period), which for the 2010 and 2011 allocations were 2004-2006. The calculations take into account various factors including local supplies, wholesale supplies, retail supplies, demands, in-lieu deliveries, agricultural deliveries, conservation achieved and conservation rate structures.

- <u>Step 2: Allocation Year Calculations</u>: The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies. A number of factors are taken into consideration in this step including: (1) allocation year retail demands; (2) allocation year local supplies; and (3) allocation year wholesale demands.

- <u>Step 3: Supply Allocation Calculations</u>: The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Again, several elements are considered at this stage including: (1) regional shortage levels; (2) regional shortage percentages; (3) extraordinary increased production adjustments; (4) wholesale minimum allocations; (5) maximum retail impact adjustments; (6) interim agricultural water program reductions; (7) conservation demand hardening credits; (8) municipal and industrial allocations; and (9) total allocation

The Allocation Plan takes effect when a regional shortage is declared by Metropolitan's Board of Directors. The allocation period covers twelve consecutive months, from July of a given year through the following June (this period was selected to minimize the impacts of varying SWP allocations and to provide member agencies with sufficient time to implement their outreach strategies and rate modifications).

The Allocation Plan also allows for an appeals process to address any changes or corrections to an agency's allocation. Appeals can be made to request adjustments for (1) erroneous historical data used in base period calculations; (2) unforeseen loss or gain in local supply; (3) extraordinary increases in local supply; (4) population growth rates; and (5) reviewing calculation of base period, allocation year and supply allocation figures for consistency with the standards outlined in the Allocation Plan.

The Allocation Plan also allows for enforcement through a penalty rate structure. Penalty rates and charges will only be assessed to the extent that an agency's total annual usage exceeds its total annual allocation. Any funds collected will be applied towards investments in conservation and local resources development within the service area of the member agency by which the penalties are incurred. No billing or assessment of penalty rates will take place until the end of the twelve-month allocation period.

Additional information on Metropolitan's Water Supply Allocation Plan can be found in that document as previously referenced by footnote.

Health and Safety Requirements

The primary goal of the District's water system is to preserve the health and safety of its personnel and the public. Meeting this goal is a continuous function of the system – before, during and after a disaster or water shortage. Fire suppression capabilities will continue to be maintained during any water shortage contingency stage. Some water needs are more immediate than others. The following list of public health needs and the allowable time without potable water is a guideline and will depend on the magnitude of the water shortage:

- Hospitals – continuous need
- Emergency shelters – immediate need
- Kidney dialysis – 24 hours
- Drinking water – 72 hours
- Personal hygiene, waste disposal – 72 hours

Based on commonly accepted estimates of interior residential water use in the United States, Table 8.2-1 indicates per capita health and safety water requirements. During the initial stage of a shortage, customers may adjust either interior and/or outdoor water use to meet the voluntary water reduction goal.

Table 8.2-1
Per Capita Health and Safety Water Quantity Calculations

	Non-Conserving Fixtures		Habit Changes[1]		Conserving Fixtures[2]	
Toilet	5 flushes x 5.5 gpf	27.5	3 flushes x 5.5 gpf	16.5	5 flushes x 1.6 gpf	8.0
Shower	5 min. x 4.0 gpm	20.0	4 min. x 3.0 gpm	12.0	4 min. x 2.5 gpm	10.0
Washer	12.5 gpcd	12.5	11.5 gpcd	11.5	11.5 gpcd	11.5
Kitchen	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Other	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Total		68.0		48.0		37.5
CCF per capita per year		33.0		23.0		18.0

gpcd = gallons per capita per day
gpf = gallons per flush
gpm = gallons per minute
CCF = hundred cubic feet (approximately 748 gallons)
[1] Reduced shower use results from shorter and reduced flow. Reduced washer use results from fuller loads.
[2] Fixtures include ULF 1.6 gpf toilets, 2.5 gpm showerheads, and efficient clothes washers.

Priority by Use

Conditions prevailing in the District service area require that available water resources be put to maximum beneficial use to the extent possible. The waste, unreasonable use, or unreasonable method of use, of water should be prevented and water conservation and water use efficiency should be encouraged with a view toward maximizing reasonable and beneficial use thereof in the interests of the people of the District and for the public welfare. Preservation of health and safety will be a top priority for the District.

8.3 ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS

Metropolitan projects 100 percent reliability for full-service demands from 2015 through the year 2035, as does Calleguas. However, Metropolitan did not make projections for 2010 in their 2010 RUWMP and therefore Calleguas assumed a worst case scenario in interpolating supply for the next three years. Calleguas assumed the current drought would persist through 2013, resulting in Metropolitan import allocations similar to 2009.[41] The drought has officially been declared over and Metropolitan has rescinded its allocations, so this assumption is not valid. However, this worst case scenario resulted in import shortages of 9, 10 and 10% over the next three-year period, respectively for Calleguas in their 2010 UWMP. Using these very conservative assumptions (and really non-realistic, since the drought and allocations are over), the District would have a deficit in imported supply through the next three years as shown in Table 8.3-1. The biggest deficit is 1,389 AFY in 2011, which could be met by reducing demands through water

[41] Calleguas Municipal Water District Final UWMP, Table 6-3, p. 6-4, May 2011.

allocations as was accomplished in FY 2010 where demands were reduced to 11,714 AFY from the previous three years when demands were over 13,000 AFY each year. Additionally, groundwater over and above the District's allocation could be pumped using FCGMA credits.

Table 8.3-1
Three Year Estimated Minimum Water Supply
(Based on Driest 3-Year Historic Sequence, AFY)

	2011	2012	2013
Recycled Water [1]	450	1,100	1,100
Recovered Groundwater [2]	0	0	0
Potable Groundwater	2,240	2,240	2,240
Import Supply Available [3]	9,511	9,407	9,407
Total District Supply	**12,201**	**12,747**	**12,747**
Total District Demand [4]	13,590	13,733	13,876
Surplus	-1,389	-986	-1,129

[1] Recycled water expansion on line by 2012

[2] Moorpark Desalter not on line until 2015

[3] Import supply available assumes 9, 10, and 10 percent reduction for next three years from 2010 import supply shown for VCWWD No. 1 in Calleguas 2010 UWMP, Appendix C, per Table 6-3 in Calleguas 2010 UWMP.

[4] Demand interpolated from projected Normal Year Demand between 2010 of 13,447 AFY and 2015 demand for Normal Year from Table 5.2-1.

The District relies on groundwater wells accessing the Las Posas groundwater basin managed by FCGMA and imported water from Metropolitan through Calleguas. Both sources of water are vitally important to the District. Calleguas and FCGMA are implementing water supply alternative strategies for the region and on behalf of its member agencies to insure available water in the future and during shortages. The District can pump more than the allotted amount during shortage or emergencies, using credits, as noted above.

Supplemental water supplies are discussed in Section 4, Water Reliability Planning. Supplies discussed include regionally beneficial programs, including management of water system pressures and peak demands, water exchanges or transfers, conjunctive use programs, recycled water projects and desalination. These options include programs for expanded local supplies. Additional actions to manage limited supplies would include both operational and demand management measures, encompassing alternative rate structures, distribution of water use efficiency devices, and enhanced school education and public information.

The Calleguas 2010 Regional UWMP further discusses programs by Calleguas, FCGMA and Metropolitan for the benefit of the region and its member agencies, including the Ventura County Waterworks District No. 1.

8.4 CATASTROPHIC SUPPLY INTERRUPTION PLAN

Water Shortage Emergency Response

A water shortage emergency could be the result of a catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions. These emergencies and the District's method for handling them are described below.

8.4.1 Earthquakes or Other Natural Disasters

The District is located in an earthquake zone. In the event of an earthquake or natural disaster, the District has the potential of losing its imported water supply. If such a loss occurs, the District could temporarily increase its groundwater production using FCGMA credits to meet water demand until the damage was repaired and the supply restored. In the event of a prolonged loss of imported water, the District could implement their established Water Shortage Plan from the Rules and Regulations to substantially reduce demands until supply is restored, as discussed below.

8.4.2 Contamination

Contamination of water supply can result from a number of different events including a water main break, cross-connection condition, water source pollution, or covert action. Water supplies for the District are generally of good quality and no foreseeable permanent contamination issues are anticipated. In the event of a toxic spill or major contamination, the District would isolate the problem and reduce the impact to the water supply. Once the problem has been isolated, the contamination would be cleaned up using chlorination or other necessary procedures and the water supply returned to service as soon as possible. In the meantime, GMA credits or alternative supply would be utilized to meet demand. Implementation of additional demand management measures could also be utilized if the outage is anticipated to be of longer duration.

8.4.3 Emergency Power Outage

In the event of a regional power outage, the District would follow the procedures outlined in their Emergency Procedures Manual (EPM) Section VII. The District's EPM identifies various levels of emergencies and provides examples of actions for a number of given emergencies, including power failure. Standby generators are available at each of the District's well and pump station sites to maintain operation should an interruption of power occur. Section IX of the EPM lists all of the stationary and mobile generators located at the various District facilities, with model numbers, kilowatt rating, and fuel tank capacity. In addition, the District would implement the procedures outlined in the Rules and Regulations regarding water shortages (see Appendix G) which includes actions for any event which results in loss of supply.

8.5 PROHIBITIONS, PENALTIES, AND CONSUMPTION REDUCTION METHODS

As part of the District's Water Shortage Plan in the District's Rules and Regulations, water use restrictions are set forth in Part 1 - Section K, and penalties imposed for violation are described in Section L, of the District's Rules and Regulations as included in Appendix G.

The District will follow the allocation plan guidelines of Metropolitan as adopted by Calleguas once an extreme shortage is declared. This allocation plan will be enforced by Metropolitan as set forth in their Water Supply Allocation Plan. Calleguas will follow the guidelines of the allocation plan and impose any surcharges that Metropolitan applies to its member agencies that exceed their water allocation, as set forth in the plan, as required to enforce consumption reductions up to a 50% reduction in water supply. The District would correspondingly impose surcharges or penalties in accordance with its ordinance on excessive use of water.

8.6 REVENUE AND EXPENDITURE IMPACTS AND MEASURES TO OVERCOME THOSE IMPACTS

The District receives water revenue from a commodity charge and a fixed service charge. The rates have been designed to recover the bulk of the cost of water service in the commodity charge. An assessment of the revenue impacts as a result of the various stages of conservation previously showed that with the use of the Rate Stabilization Fund, the District would have sufficient funds to cover a water shortage without the need to increase water rates. This was proved out over the past few years. However, the Rate Stabilization Fund has been depleted due to the last few years of substantially lower water use. With the Metropolitan mandatory allocation lifted and water rate increases, the Rate Stabilization Fund should be reconstituted.

8.7 WATER SHORTAGE CONTINGENCY ORDINANCE

As discussed previously, the District's Rules and Regulations and Permanent Water Conservation Measures included in Appendix G. In addition, the City of Moorpark and the County of Ventura have adopted Water Efficient Landscaping Ordinances, which can also be referenced for new and conversion of landscape areas.

8.8 MECHANISMS TO DETERMINE REDUCTIONS IN WATER USE

Under normal conditions, potable water production figures are recorded daily. Weekly and monthly reports are prepared and monitored. This data will be used to measure the effectiveness of any water shortage contingency stage that may be implemented.

As stages of water shortage are declared by Metropolitan and Calleguas, the District will follow implementation of those stages and continue to monitor water demand levels. It is not until Shortage Stage 5 that Metropolitan may call for extraordinary conservation. During this stage, Metropolitan's Drought Program Officer will coordinate public information activities with Calleguas and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided.

The District will participate in member agency manager meetings with Calleguas to monitor and discuss water allocation charts. This will enable the District to be aware of imported water use on a timely basis.

During Metropolitan's fiscal year 2009-10 and 2010-11 a Level 2 Water Supply Allocation Plan was in effect until April 2011 when it was rescinded, which in essence called for reduction levels of 15 percent in water use by its member agencies. Metropolitan's fiscal year commences July 1 and ends June 30. These allocations were passed on by Calleguas and during FY 2009/10 the District reduced its demand by 12.4 percent of FY 2008/09 use, which was well below the required 15 percent reduction from the 3-year baseline period. Therefore, the District has responded favorably to these allocation requirements, which indicates they are effective in making water supplies last during extended drought periods.

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9 WATER RECYCLING

9.1 RECYCLED WATER IN SOUTHERN CALIFORNIA

The Southern California region, from Ventura to San Diego, discharges over 1 billion gallons (1.1 million AFY) of treated wastewater to the ocean each day. These discharges represent a potentially reliable and drought-proof water source, which if treated appropriately and utilized for irrigation and other purposes, could greatly reduce the region's and the District's reliance on imported water. As technological improvements continue to reduce treatment costs, and as public perception and acceptance continue to improve, numerous reuse opportunities may surface in the coming years. Recycled water is already a critical component of the California water picture and should continue to be so in future years because it is not subject to drought induced cutbacks.

9.2 COORDINATION OF RECYCLED WATER IN THE DISTRICT SERVICE AREA

Currently, the District serves directly applied recycled water from its Moorpark Wastewater Treatment Plant in the amount of approximately 450 AFY to the Moorpark Country Club Golf Course area for M&I purposes. In 2012 an expansion of this system will increase production and delivery of tertiary treated wastewater effluent to additional irrigation customers in the Moorpark Country Club as well as to agricultural irrigation customers in the area.

9.3 WASTEWATER COLLECTION AND TREATMENT IN THE DISTRICT SERVICE AREA

Wastewater from the District's water service area is collected and treated by the Wastewater Division of the District. The District operates and maintains the localized sewer collection pipelines and trunk sewers, primarily in the City of Moorpark, that feed into Moorpark Wastewater Treatment Facility.

Moorpark Wastewater Treatment Plant

As previously noted, the District's Moorpark Wastewater Treatment Plant is located along Highway 118 just west of the Moorpark city limits. The plant provides advanced primary and secondary treatment for disposal to percolation ponds as well as tertriary treatment for recycled water effluent. In 2010, the plant had an average inflow of 2.21 mgd and supplied average flows of 0.34 mgd of recycled water for landscape irrigation and 1.87 mgd for percolation and eventual groundwater recharge. As mentioned previously, this treatment facility has a total capacity of 5.0 mgd and a tertiary capacity of 1.5 mgd.

9.4 POTENTIAL USES OF RECYCLED WATER

The District recognizes the potential uses of recycled water in its community, such as large landscaped areas including homeowner's associations and city medians, parks, schoolyards, industrial and other uses. Because of this recognition, the District is currently implementing an expansion of it recycled water system to serve additional landscape irrigation demands within the Moorpark Country Club Estates community including nurseries, homeowner's associations and city medians, as well as its first agricultural irrigation customers

9.5 PROJECTED AND POTENTIAL USES OF RECYCLED WATER

The District's 2005 UWMP projected that by 2010 surplus recycled water would be available from Simi Valley in the amount of approximately 1.180 AFY and the Moorpark Wastewater Treatment Plant would be providing approximately 2,000 AFY. All recycled water from Simi Valley, over and above the flow necessary to meet downstream watershed requirements, is being utilized upstream from the District. Also, expansion of the Moorpark Treatment system has been cut back to a more conservative 1,100 AFY and will be available by 2012 as opposed to the original plan of 2010 projected back in the 2005 UWMP. A future expansion of the recycled water distribution system to serve an additional 500 AFY bringing the total to 1,600 AFY is in the preliminary planning stages and conservatively envisioned to come on line between 2015 and 2020.

9.6 ENCOURAGING RECYCLED WATER USE

Studies of water recycling opportunities within southern California provide a context for promoting the development of water recycling plans. It is recognized that broad public acceptance of recycled water requires continued education and public involvement. However, planning for most of the recycled water available is being directed toward replenishment of the Basin and improvements in groundwater quality.

Public Education

The District continues to participate in Calleguas' public education and school education programs, which include extensive learning programs on water recycling. Calleguas' water use efficiency public information programs are a partnership with agencies throughout the county.

Calleguas staff reaches out to area residents including those in the District, through a variety of public information programs. These programs include information on present and future water supplies, demands for a suitable quantity and quality of water, including recycled water, and the importance of implementing water efficient techniques and behaviors. Through Calleguas, water education programs have reached thousands of students with grade-specific programs that include information on recycled water.

Over the past five years, District staff has reached an estimated approximately 30,000 students, including the Annual Student Art Competition, School Presentations, Traveling

Art Exhibit, and Award Ceremonies. The District has also been distributing materials to students during Country Days, a local community fair for the residents of the Moorpark area. The District has been attending this event since 2007 with estimated attendance of around 4,000 per year.

Financial Incentives

The implementation of recycled water projects involves a substantial upfront capital investment for planning studies, environmental impact reports, engineering design and construction before there is any recycled water to market. For some water agencies, these capital costs exceed the short-term expense of purchasing additional imported water supplies from Metropolitan.

The establishment of new supplemental funding sources through federal, state and regional programs now provide significant financial incentives for local agencies to develop and make use of recycled water. Potential sources of funding include federal, state and local funding opportunities. These funding sources include the USBR, California Proposition 13 Water Bond, and Metropolitan's Local Resources Program. These funding opportunities may be sought by the District or possibly more appropriately by regional agencies. The District will continue to support seeking funding for regional water recycling projects and programs.

9.7 OPTIMIZING RECYCLED WATER USE

In Ventura County, the majority of recycled water is used for recharging the Basin, irrigating golf courses, parks, schools, business and communal landscaping. However, future recycled water use can increase by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pumping stations and transmission mains to reach areas far from the treatment plants. Gains in implementing some of these projects have been made throughout the county; however, the additional costs, large energy requirements and required infrastructure, make such projects very expensive to pursue.

To optimize the use of recycled water, cost/benefit analysis must be conducted for each potential project. Once again, this brings discussion about the technical and economic feasibility of a recycled water project, which in turn, requires a relative comparison to alternative water supply options. For the District, analysis has shown capital costs exceed the short-term expense of purchasing additional imported water supplies from Metropolitan. Except for the current planned expansion of the recycled water system that will provide up to 1,100 AFY by 2012 and a future expansion up to 1,600 by 2020, it is not anticipated that additional direct reuse projects will be pursued by the District and are, therefore, not included in future supply projections.

The District will continue to conduct cost/benefit analysis when feasible for recycled water projects, and seek creative solutions and a balance to recycled water use, in coordination with Calleguas, Metropolitan and other cooperative agencies. These include solutions for funding, regulatory requirements, institutional arrangements and public acceptance.

Appendix A

Urban Water Management Plan Act as Amended

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

All California Codes have been updated to include the 2010 Statutes.

WATER CODE
SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact

on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

WATER CODE
SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

WATER CODE
SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

WATER CODE
SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall

determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of

the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic

sequence for the agency's water supply.
(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
(6) Penalties or charges for excessive use, where applicable.
(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
(8) A draft water shortage contingency resolution or ordinance.
(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.
(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:
(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
(e) The projected use of recycled water within the supplier's

service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

WATER CODE
SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

WATER CODE
SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section

10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

WATER CODE
SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the

"Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

Senate Bill No. 7

CHAPTER 4

An act to amend and repeal Section 10631.5 of, to add Part 2.55 (commencing with Section 10608) to Division 6 of, and to repeal and add Part 2.8 (commencing with Section 10800) of Division 6 of, the Water Code, relating to water.

[Approved by Governor November 10, 2009. Filed with Secretary of State November 10, 2009.]

LEGISLATIVE COUNSEL'S DIGEST

SB 7, Steinberg. Water conservation.

(1) Existing law requires the Department of Water Resources to convene an independent technical panel to provide information to the department and the Legislature on new demand management measures, technologies, and approaches. "Demand management measures" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

This bill would require the state to achieve a 20% reduction in urban per capita water use in California by December 31, 2020. The state would be required to make incremental progress towards this goal by reducing per capita water use by at least 10% on or before December 31, 2015. The bill would require each urban retail water supplier to develop urban water use targets and an interim urban water use target, in accordance with specified requirements. The bill would require agricultural water suppliers to implement efficient water management practices. The bill would require the department, in consultation with other state agencies, to develop a single standardized water use reporting form. The bill, with certain exceptions, would provide that urban retail water suppliers, on and after July 1, 2016, and agricultural water suppliers, on and after July 1, 2013, are not eligible for state water grants or loans unless they comply with the water conservation requirements established by the bill. The bill would repeal, on July 1, 2016, an existing requirement that conditions eligibility for certain water management grants or loans to an urban water supplier on the implementation of certain water demand management measures.

(2) Existing law, until January 1, 1993, and thereafter only as specified, requires certain agricultural water suppliers to prepare and adopt water management plans.

This bill would revise existing law relating to agricultural water management planning to require agricultural water suppliers to prepare and adopt agricultural water management plans with specified components on or before December 31, 2012, and update those plans on or before December

31, 2015, and on or before December 31 every 5 years thereafter. An agricultural water supplier that becomes an agricultural water supplier after December 31, 2012, would be required to prepare and adopt an agricultural water management plan within one year after becoming an agricultural water supplier. The agricultural water supplier would be required to notify each city or county within which the supplier provides water supplies with regard to the preparation or review of the plan. The bill would require the agricultural water supplier to submit copies of the plan to the department and other specified entities. The bill would provide that an agricultural water supplier is not eligible for state water grants or loans unless the supplier complies with the water management planning requirements established by the bill.

(3) The bill would take effect only if SB 1 and SB 6 of the 2009–10 7th Extraordinary Session of the Legislature are enacted and become effective.

The people of the State of California do enact as follows:

SECTION 1. Part 2.55 (commencing with Section 10608) is added to Division 6 of the Water Code, to read:

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION

Chapter 1. General Declarations and Policy

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an

administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2. Definitions

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of

a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(*l*) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

Chapter 3. Urban Retail Water Suppliers

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in subdivision (a) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies

available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (*l*) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) An urban retail water supplier shall be granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the United States Department of Defense military installation's requirements under federal Executive Order 13423.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. The department shall review the 2015 urban water management plans and report to the Legislature by December 31, 2016, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets in order to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use on facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4. Agricultural Water Suppliers

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier’s pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5. Sustainable Water Management

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6. Standardized Data Collection

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7. Funding Provisions

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the

Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8. Quantifying Agricultural Water Use Efficiency

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

SEC. 2. Section 10631.5 of the Water Code is amended to read:

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

SEC. 3. Part 2.8 (commencing with Section 10800) of Division 6 of the Water Code is repealed.

SEC. 4. Part 2.8 (commencing with Section 10800) is added to Division 6 of the Water Code, to read:

PART 2.8. AGRICULTURAL WATER MANAGEMENT PLANNING

Chapter 1. General Declarations and Policy

10800. This part shall be known and may be cited as the Agricultural Water Management Planning Act.

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) Urban water districts are required to adopt water management plans.

(d) The conservation of agricultural water supplies is of great statewide concern.

(e) There is a great amount of reuse of delivered water, both inside and outside the water service areas.

(f) Significant noncrop beneficial uses are associated with agricultural water use, including streamflows and wildlife habitat.

(g) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.

(h) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.

(i) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.

(j) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.

10802. The Legislature finds and declares that all of the following are the policies of the state:

(a) The conservation of water shall be pursued actively to protect both the people of the state and the state's water resources.

(b) The conservation of agricultural water supplies shall be an important criterion in public decisions with regard to water.

(c) Agricultural water suppliers shall be required to prepare water management plans to achieve conservation of water.

Chapter 2. Definitions

10810. Unless the context otherwise requires, the definitions set forth in this chapter govern the construction of this part.

10811. "Agricultural water management plan" or "plan" means an agricultural water management plan prepared pursuant to this part.

10812. "Agricultural water supplier" has the same meaning as defined in Section 10608.12.

10813. "Customer" means a purchaser of water from a water supplier who uses water for agricultural purposes.

10814. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of that entity.

10815. "Public agency" means any city, county, city and county, special district, or other public entity.

10816. "Urban water supplier" has the same meaning as set forth in Section 10617.

10817. “Water conservation” means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

Chapter 3. Agricultural Water Management Plans

Article 1. General Provisions

10820. (a) An agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015, and on or before December 31 every five years thereafter.

(b) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(c) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

10821. (a) An agricultural water supplier required to prepare a plan pursuant to this part shall notify each city or county within which the supplier provides water supplies that the agricultural water supplier will be preparing the plan or reviewing the plan and considering amendments or changes to the plan. The agricultural water supplier may consult with, and obtain comments from, each city or county that receives notice pursuant to this subdivision.

(b) The amendments to, or changes in, the plan shall be adopted and submitted in the manner set forth in Article 3 (commencing with Section 10840).

Article 2. Contents of Plans

10825. (a) It is the intent of the Legislature in enacting this part to allow levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

(b) This part does not require the implementation of water conservation programs or practices that are not locally cost effective.

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities.

(3) Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.
(6) Water delivery measurements or calculations.
(7) Water rate schedules and billing.
(8) Water shortage allocation policies.
(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:
(1) Surface water supply.
(2) Groundwater supply.
(3) Other water supplies.
(4) Source water quality monitoring practices.
(5) Water uses within the agricultural water supplier's service area, including all of the following:
(A) Agricultural.
(B) Environmental.
(C) Recreational.
(D) Municipal and industrial.
(E) Groundwater recharge.
(F) Transfers and exchanges.
(G) Other water uses.
(6) Drainage from the water supplier's service area.
(7) Water accounting, including all of the following:
(A) Quantifying the water supplier's water supplies.
(B) Tabulating water uses.
(C) Overall water budget.
(8) Water supply reliability.
(c) Include an analysis, based on available information, of the effect of climate change on future water supplies.
(d) Describe previous water management activities.
(e) Include in the plan the water use efficiency information required pursuant to Section 10608.48.

10827. Agricultural water suppliers that are members of the Agricultural Water Management Council, and that submit water management plans to that council in accordance with the "Memorandum of Understanding Regarding Efficient Water Management Practices By Agricultural Water Suppliers In California," dated January 1, 1999, may submit the water management plans identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10826.

10828. (a) Agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, may submit those water conservation plans to satisfy the requirements of Section 10826, if both of the following apply:
(1) The agricultural water supplier has adopted and submitted the water conservation plan to the United States Bureau of Reclamation within the previous four years.

(2) The United States Bureau of Reclamation has accepted the water conservation plan as adequate.

(b) This part does not require agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, to prepare and adopt water conservation plans according to a schedule that is different from that required by the United States Bureau of Reclamation.

10829. An agricultural water supplier may satisfy the requirements of this part by adopting an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) or by participation in areawide, regional, watershed, or basinwide water management planning if those plans meet or exceed the requirements of this part.

Article 3. Adoption and Implementation of Plans

10840. Every agricultural water supplier shall prepare its plan pursuant to Article 2 (commencing with Section 10825).

10841. Prior to adopting a plan, the agricultural water supplier shall make the proposed plan available for public inspection, and shall hold a public hearing on the plan. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned agricultural water supplier pursuant to Section 6066 of the Government Code. A privately owned agricultural water supplier shall provide an equivalent notice within its service area and shall provide a reasonably equivalent opportunity that would otherwise be afforded through a public hearing process for interested parties to provide input on the plan. After the hearing, the plan shall be adopted as prepared or as modified during or after the hearing.

10842. An agricultural water supplier shall implement the plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.

10843. (a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after the adoption of the plan. Copies of amendments or changes to the plans shall be submitted to the entities identified in subdivision (b) within 30 days after the adoption of the amendments or changes.

(b) An agricultural water supplier shall submit a copy of its plan and amendments or changes to the plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.

(5) Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.

(6) The California State Library.

(7) Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.

10844. (a) Not later than 30 days after the date of adopting its plan, the agricultural water supplier shall make the plan available for public review on the agricultural water supplier's Internet Web site.

(b) An agricultural water supplier that does not have an Internet Web site shall submit to the department, not later than 30 days after the date of adopting its plan, a copy of the adopted plan in an electronic format. The department shall make the plan available for public review on the department's Internet Web site.

10845. (a) The department shall prepare and submit to the Legislature, on or before December 31, 2013, and thereafter in the years ending in six and years ending in one, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

Chapter 4. Miscellaneous Provisions

10850. (a) Any action or proceeding to attack, review, set aside, void, or annul the acts or decisions of an agricultural water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(1) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(2) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 120 days after submitting the plan or amendments to the plan to entities in accordance with Section 10844 or the taking of that action.

(b) In an action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an agricultural water supplier, on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the agricultural water supplier has not proceeded in a manner required by law, or if the action by the agricultural water supplier is not supported by substantial evidence.

10851. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part. This part does not exempt projects for implementation of the plan or for expanded or additional water supplies from the California Environmental Quality Act.

10852. An agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

10853. No agricultural water supplier that provides water to less than 25,000 irrigated acres, excluding recycled water, shall be required to implement the requirements of this part or Part 2.55 (commencing with Section 10608) unless sufficient funding has specifically been provided to that water supplier for these purposes.

SEC. 5. This act shall take effect only if Senate Bill 1 and Senate Bill 6 of the 2009–10 Seventh Extraordinary Session of the Legislature are enacted and become effective.

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Appendix B

DWR UWMP Checklist Organized by Subject

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Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1, Pg. 5-7
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1, Pg. 5-6 and Appendix C
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Section 1, Pg. 2-4 and Appendix C
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1, Pg. 4
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Appendix C
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1, Pg. 4 and Appendix C
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642	What is the difference between item 7 and 58	Section 1, Pg. 4
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 1, Pg. 6-7

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1, Pg. 4
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1, Pg. 4
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 1, Pg. 7
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 1, Pg. 8-9
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 1, Pg. 9
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 1, Pg. 9
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 1, Pg. 9
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 5, Pg. 1 and Appendix E
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Appendix C Public Hearing held on June 28, 2011

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Section 5, Pg. 5
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 6, Pg. 1
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 5, Pg. 1-5
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 5, Pg. 5-6
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 2, Pg. 6
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 2, Pg. 4-6
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 2, Pg. 4 and Appendix H
16	Describe the groundwater basin.	10631(b)(2)		Section 2, Pg. 4
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Section 2, Pg. 4

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Not Applicable.
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 2, Pg. 4
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 1, Pg. 10 and Section 2, Pg. 4-5
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 2, Pg. 4-6
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4, Pg. 10-14
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4, Pg. 23-24
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 4, Pg. 33-35
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 9, Pg. 1-3
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 9, Pg. 1

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 9, Pg. 1
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 9, Pg. 1
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 9, Pg. 2
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 9, Pg. 2
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 9, Pg 2-3
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 9, Pg. 3
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 4, Pg. 23-24 & 33-35
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 5, Pg. 1-5
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 4, Pg. 23-35 and Section 7, Pg. 1-2
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 8, Pg. 1-11

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 8, Pg. 7-8
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 8, Pg. 9
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 8, Pg. 10 and Appendix G
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 8, Pg. 10 and Appendix G
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 8, Pg. 10 and Appendix G
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 8, Pg. 10
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Section 8, Pg. 10 and Appendix G
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 8, Pg. 10-11
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 3, Pg. 1-13

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5, Pg. 1-4
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 7, Pg 1-2
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 7, Pg 1-2
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 5, Pg. 6-7 and Section 8, Pg. 11
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Appendix F
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Appendix F

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

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Appendix C

Notice of Public Hearing and Resolution of Adoption

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Appendix D

References Used in the Production of this UWMP

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Technical Memorandum on Calculation of SB7x7 Baseline 2020 Targets for Water Conservation Per Capita Use

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TECHNICAL MEMORANDUM

To: Cefe Munoz

From: Mike Swan

Date: April 22, 2011

Subject: 20x2020 Baseline Calculation & Water Use Target Method Selection

According to the Department of Water Resources (DWR), a water supplier must define a continuous 10 or 15 year base period (baseline) for water use ending no earlier than December 31, 2004 and no later than December 31, 2010 that will be used to develop their per capita water use target for the year 2020 and an interim target for 2015. A water supplier who met at least 10 percent of its 2008 measured retail water demand through recycled water may use a 15-year baseline period; otherwise a supplier must use a 10-year baseline. Ventura County Waterworks District No. 1 (District) supplied 469 acre-feet of recycled water in FY 2007/08 out of a total supply of 13,876 acre-feet, which is only 3.4 percent, and as a result must use a 10-year baseline.

Table 1 shows the gross water use, the population, and the per capita water use of the District's water service area from water years FY 1996 through FY 2010. Groundwater production, imported water and recycled water use comes from production reports furnished by the District and agricultural use is from agricultural meter reads within the system also provided by the District. The District used the Appendix A population methodology to estimate the population within the entire service area. The most advantageous period for the District to use is the one generating the highest per capita use, making subsequent conservation easier to achieve. Therefore, the 10-year period from FY 2000 through FY 2009 was determined to be the most advantageous and was used to calculate a baseline per capita water use average of 239.8 gallons per capita per day (GPCD) as shown in *Table 1*.

9.7.1.1 Ventura County Waterworks District No. 1 Base Daily Per Capita Use

Fiscal Year	Groundwater Production (AFY)	Imported Water (AFY)	Recycled Water (AFY)[1]	Agri-cultural Use (AFY)[2]	Gross Water Use [3] (AFY)	Gross Water Use (gal/day)	Water Service Area Population [4]	Annual /Capita Use (GPCD)
1996	1,401	9,359	0	2,664	8,096	7,227,151	28,834	250.6
1997	133	10,608	0	3,259	7,482	6,679,044	29,289	228.0
1998	1,590	8,074	0	2,314	7,350	6,561,210	32,079	204.5
1999	2,064	8,441	0	3,105	7,400	6,605,844	30,680	215.3
2000	2,315	9,261	0	3,249	8,327	7,433,360	30,287	245.4
2001	817	10,074	0	2,890	8,001	7,142,346	30,507	234.1
2002	1,569	10,969	0	3,669	8,869	7,917,193	31,502	251.3
2003	1,331	10,347	0	2,922	8,756	7,816,320	32,704	239.0
2004	94	13,545	381	3,709	9,549	8,524,217	32,664	261.5
2005	249	11,624	437	2,615	8,821	7,874,345	33,563	234.6
2006	159	11,310	218	2,614	8,637	7,710,091	33,774	228.3
2007	414	12,214	472	3,464	8,692	7,759,189	35,006	221.7
2008	1,493	11,914	469	2,869	10,069	8,988,411	35,690	251.8
2009	2,083	10,534	458	3,040	9,119	8,140,364	35,350	230.3
2010	2,165	9,161	388	2,646	8,292	7,402,116	35,354	209.4
							Baseline (Average FY 2000-2009)	239.8
							Minimum Baseline (Average FY 2004-2008)	239.6

[1] Recycled Water from Moorpark Wastewater Treatment Plant
[2] Metered Agricultural Water Use
[3] Gross Water Use = Groundwater Production + Imported - Recycled – Agricultural
[4] Appendix A population methodology for estimated population within the entire service area.

A water supplier must set a 2020 water use target and a 2015 interim target using one of the following four methods as defined further in Section 10608.20 of Senate Bill No. 7 (SB7x7):

- Method 1: Eighty percent of the water supplier's baseline per capita water use
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscape area water use; and commercial, industrial, and institutional uses

- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservations Plan

- Method 4: A BMP Option based on standards that are consistent with the California Urban Water Conservation Council's (CUWCC) best management practices (BMPs).

If the average base daily per capita water use is greater than 100 GPCD for a defined 5-year baseline period, the legislation's minimum water use reduction requirement must also be met as set in Section 10608.22 of Senate Bill No. 7 SB7x7.

Per SB7x7, the minimum water use reduction baseline period must end no earlier than December 31, 2007 and no later than December 31, 2010 and the minimum reduction shall be no less than 5 percent of this 5-year base daily per capita water use. A minimum water use reduction baseline period between FY 2004 through 2008 was selected to calculate the most advantageous 5-year minimum water use reduction target. As shown in *Table 1,* the minimum baseline water use averages to 239.6 GPCD. The minimum per capita water use target for 2020 must therefore be 227.6 GPCD (95% of 239.6).

Calculation of Targets Using Methods 1 – 4

Method 1: Using a baseline per capita average of 239.8 GPCD (shown in Table 1) the Ventura County Waterworks District No. 1 2020 target would be 191.8 GPCD (80% of 239.8). Since the target water use for Method 1 is less than the one found using the legislation's minimum requirement criteria (227.6), no further adjustments to this water use target would be required, if this method is selected.

Method 2: The District does not currently maintain records of lot size, irrigated landscaped area for each parcel, reference evapotranspiration for each parcel, etc. to split its residential, commercial, industrial, or institutional uses into inside and outside (landscape irrigation) uses. The use of Method 2 to calculate conservation targets is therefore not feasible.

Method 3: The Ventura County Waterworks District No. 1 falls within the South Coast Hydrologic Region (Hydrologic Region 4). According to the State's April 30, 2009 draft 20x2020 Water Conservation Plan, the 2020 Target for Hydrologic Region 4 is 149 GPCD. Using Method 3, the District's 2020 water use target would be 141.6 GPCD (95% of 149). Since the target water use for Method 3 is less than the one found using the legislation's minimum requirement criteria (227.6), no further adjustments to this water use target would be required, if this method is selected.

Method 4: DWR recently released this method and a calculator for agencies wishing to use this BMP-based method. Per DWR's alternative 2 procedure, a default indoor residential water savings of 15 GPCD was assumed. Another required component in DWR's Provisional Method 4 calculator is the Commercial, Industrial and Institutional (CII) water use consumption for the mid-point of the baseline period. This was obtained from the District supplied water usage data for year 2004 and was 1,874 AF. The resultant 2020 water use target using DWR's "SB7x7 Provisional Method 4 Target Calculator" was 186.5 GPCD.

Conclusion

The discussion and calculations above are summarized in *Table 2*.

9.7.1.2 Table 2
Ventura County Waterworks District No. 1
Water Use Target Summary (GPCD)

Method	2020
1	191.8
2	Not Applicable
3	141.6
4	186.5

As shown in *Table 2*, Method 1 results in the most favorable water use target level for the Ventura County Waterworks District No. 1. The 2015 interim target would then be 215.8 GPCD (mid-point between 239.8 GPCD baseline and 191.8 GPCD 2020 target). It should be noted that the District has never met this 2020 target, but did achieve the interim 2015 goal of 215.8 GPCD in FY 1998 and 1999.

Appendix F

CUWCC Best Management Practices Annual Reports, Coverage Reports, and Activity Reports, 2007-2008 and 2009-2010

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Reported as of 12/24/08

Water Supply & Reuse

Reporting Unit:
Ventura County Waterworks Dist. #1

Year:
2007

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Calleguas Municipal Water District	12318.8	Imported
District	1032.6	Groundwater

Total AF: 13351.4

Reported as of 12/24/08

Accounts & Water Use

Reporting Unit Name:	Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Service Area Population Information:

1. Total service area population 36786

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	9436	7922.7	0	0
2. Multi-Family	0	0	0	0
3. Commercial	218	738.5	0	0
4. Industrial	71	249.2	0	0
5. Institutional	142	927.6	0	0
6. Dedicated Irrigation	179	3294.5	0	0
7. Recycled Water	1	481.7	0	0
8. Other	248	54.1	0	0
9. Unaccounted	NA	0	NA	0
Total	10295	13668.3	0	0
	Metered		**Unmetered**	

Reported as of 12/24/08

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

1. Based on your signed MOU date, 08/27/1991, your Agency STRATEGY DUE DATE is:	08/26/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1993
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1993

B. Water Survey Data

Survey Counts:	**Single Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	0	2
2. Number of surveys completed:	0	2
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)		Other
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		spreadsheet
b. Describe how your agency tracks this information.		

We keep records of each survey offered, status of each survey, resultant allocation adjustments.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? — no

    a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? — yes

3. Estimated percent of single-family households with low-flow showerheads: — 85%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? — no

5. Estimated percent of multi-family households with low-flow showerheads: — 60%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

    We keep records of rebates & new development. Percentages calculated as flows - homes built after 1993 = 100% low-flow fixtures. Homes built prior to 1991 rebates low-flow install tracked to get percentage.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? — yes

    a. If YES, when did your agency begin implementing this strategy? — 01/01/1994

    b. Describe your targeting/ marketing strategy.

    We put a comment on our bills to advertise out "ULFT Toilet Rebate" Program. There is also information regarding available rebates on our website. Gave away low-flow showerheads at our local Country Days event.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	300	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	2	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? — yes

    a. If YES, in what format are low-flow devices tracked? — Spreadsheet

    b. If yes, describe your tracking and distribution system :

    We keep a database to identify all customers who receive rebates, and the number of rebates(maximum 2) for each customer. This allows us to determine the number and amount of rebates during any one year. We do not track cost of ULFTs because they are provided through CMWD

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	yes
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	13889.7
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	13351.4
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	1.04
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	yes
7. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Purchases and sales are tracked on a monthly basis. We perform system leak detection when our unaccounted water loss >6%, and we repair all leaks when found. O&M staff has regularly scheduled system check. We also monitor unmetered water use, such as water used in flushing and other system maintenance.

B. Survey Data

1. Total number of miles of distribution system line.	138
2. Number of miles of distribution system line surveyed.	138

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

We compare production vs. consumption to be sure percentage of loss is less than 6%

D. Comments

A. Prod 13341.4 b. Usage 13186.6 % less = A-B = 1.2% A

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:		
2. Volume treated water supplied into the system:		
3. Volume of water exported from the system:		
4. Volume of billed authorized metered consumption:		
5. Volume of billed authorized unmetered consumption:		
6. Volume of unbilled authorized metered consumption:		
7. Volume of unbilled authorized unmetered consumption:		

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:
2. How frequently are they tested and calibrated?
3. Length of mains:
4. What % of distribution mains are rigid pipes (metal, ac, concrete)?
5. Number of service connections:
6. What % of service connections are rigid pipes (metal)?
7. Are residential properties fully metered?
8. Are non-residential properties fully metered?
9. Provide an estimate of customer meter under-registration:
10. Average length of customer service line from the main to the point of the meter:
11. Average system pressure:
12. Range of system pressures: From to
13. What percentage of the system is fed from gravity feed?
14. What percentage of the system is fed by pumping and re-pumping?

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?
2. Does your agency test, repair and replace your meters on a regular timed schedule?
    a. If yes, does your agency test by meter size or customer category?:
    b. If yes to meter size, please provide the frequency of testing by meter size:
        Less than or equal to 1"
        1.5" to 2"
        3" and Larger
    c. If yes to customer category, provide the frequency of testing by customer category:
        SF residential

MF residential

Commercial

Industrial & Institutional

3. Who is responsible for repairs to the customer lateral or customer service line?

4. Who is responsible for service line repairs downstream of the customer meter?

5. Does your agency proactively search for leaks using leak survey techniques or does your utility reactively repair leaks which are called in, or both?

6. What is the utility budget breakdown for:

Leak Detection	$
Leak Repair	$
Auditing and Water Loss Evaluation	$
Meter Testing	$

H. Comments

Reported as of 12/24/08

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Implementation

1. Does your agency have any unmetered service connections?	No
a. If YES, has your agency completed a meter retrofit plan?	
b. If YES, number of previously unmetered accounts fitted with meters during report year:	
2. Are all new service connections being metered and billed by volume of use?	Yes
3. Are all new service connections being billed volumetrically with meters?	Yes
4. Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?	No

5. Please fill out the following matrix:

Account Type	Number of Metered Accounts	Number of Metered Accounts Read	Number of Metered Accounts Billed by Volume	Billing Frequency Per Year	Number of Volume Estimates
a. Single Family	9436	9436	9436	6	0
b. Multi-Family	0	0	0	6	0
c. Commercial	218	218	218	6	0
d. Industrial	71	71	71	6	0
e. Institutional	142	142	142	6	0
f. Landscape Irrigation	0	0	0	0	0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	
b. Describe the feasibility study:	
2. Number of CII accounts with mixed-use meters:	301
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.	0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2007**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	719
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	719
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	719
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	719
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	01/01/1994

b. Description of marketing / targeting strategy:

District has contracted with a consultant to perform large landscape water audits for high use customers who exceed their allocations. At the time of billing. top water users are identified. Upon review of their accounts, if warranted, these customers are sent applications to request a review of their allocations. If a review of the account history and the information provided in the application suggests above normal water consumption, the customer will be offered a water audit. The audit will help determine the appropriateness of the allocation, and also used to determine methods of water conservation. We also offered a California Friendly Landscape training class to our customers.

2. Number of Surveys Offered during reporting year.	3
3. Number of Surveys Completed during reporting year.	0

4. Indicate which of the following Landscape Elements are part of your survey:

a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

We review the water use to confirm efficient water use. If customer continues having a problem being efficient, we offer a follow up audit to determine whether the conservation recommendations have been implemented and to review irrigation schedules.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	yes
2. Number of CII mixed-use accounts with landscape budgets.	23
Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. (From BMP 4 report)	0
Total number of change-outs from mixed-use to dedicated irrigation meters since Base Year.	
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	no

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services?	yes

a. If YES, describe below:

The Ventura County Water Conservation Program coordinated efforts of numerous individuals and agencies on the Water Conservation Landscape Task Force to prepare the Landscape Design Criteria to comply with AB 325, Water Conservation in Landscaping Act. The Ventura County Board of Supervisors and the Board of Directors for the Ventura County Waterworks District No. 1 adopted the criteria in October 1992. The criteria use the water budget approach. We also have a variety of brochures available that detail plant water requirements and preferred irrigation practices, including "Sustainable Landscaping: Resource Efficient Landscape for the Central Coast," "Top Ten Ways to Conserve Water," and the County's "Landscape Design Criteria."

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	yes
7. Do you provide customer notices at the start of the irrigation season?	yes
8. Do you provide customer notices at the end of the irrigation season?	yes

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 12/24/08

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Coverage Goal

	Single Family	Multi-Family
1. Number of **residential** dwelling units in the agency service area.	9,106	0
2. Coverage Goal =	**= 699 Points**	

B. Implementation

1. Does your agency offer rebates for **residential** high-efficiency washers? no

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
2. **Greater than 8.5 but not exceeding 9.5** (1 point)		$ 0	$ 0	$ 0	$ 0	
3. **Greater than 6.0 but not exceeding 8.5** (2 points)		$ 0	$ 0	$ 0	$ 0	
4. **Less than or equal to 6.0** (3 points)	0	$ 0	$ 0	$ 0	$ 0	0
TOTALS:	**0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**0**

C. Past Credit Points

For HEW incentives issued before July 1, 2004, select ONE of the following TWO options:

- Method One: Points based on HEW Water Factor
- Method Two: Agency earns 1 point for each HEW.

PAST CREDIT TOTALS:	**0**	**$ 0**	**0**

D. Rebate Program Expenditures

1. Average or Estimated Administration and Overhead	$ 0
2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW?	no

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 12/24/08

BMP 07: Public Information Programs

Reporting Unit: Ventura County Waterworks Dist. #1	BMP Form Status: 100% Complete	Year: 2007

A. Implementation

1. How is your public information program implemented?
   Wholesaler and retailer both materially participate in program
   Which wholesaler(s)?
   Wholesaler and retailer both participate in program Metropolitan Water District Calleguas Municipal Water District

2. Describe the program and how it's organized:
   Public Information Messages on bills regarding Ultra Low Flush Toilet (ULFT) rebate program (finished in 7/2008)seasonal tiers, conservation tips indoors and outdoors. 2. Brochures regarding water saving tips, waterwise garding, High Efficiency Toilets and Washers and seed give aways etc. at customer service desk. 3. Gardens at the main entry to our customer service office and in the courtyard were planted with drought-resistant plants and designed to demonstrate the beauty of such plants. 4. "Water Awareness Month" activities including an annual "Water Awareness" poster contest. 5. Bill compares current usage to use during the same time period in the previous year. 6. Annual Water Quality Report 7. Paticipation in Local Country Days Event, giveaway conservation, educational items, low flow shower heads. 8. Bill inserts on Landscape training classes and conservation reminders.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	4
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	0
f. Special Events, Media Events	yes	2
g. Speaker's Bureau	no	
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing) 3750

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 08: School Education Programs

Reporting Unit:
Ventura County Waterworks Dist. #1

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. How is your public information program implemented?
   Wholesaler and retailer both participate in program
   Which wholesaler(s)?
   MWD

2. Please provide information on your region-wide school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	4	200	0
Grades 4th-6th	yes	3	550	0
Grades 7th-8th	no	0	0	0
High School	no	0	0	0

4. Did your Agency's materials meet state education framework requirements? yes

5. When did your Agency begin implementing this program? 01/01/1994

B. School Education Program Expenditures

1. Annual Expenditures (Excluding Staffing) 658.33

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period:	no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	# Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	no
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	no

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	0
b. Dual Flush Toilets	0
c. High Efficiency Toilets	0
d. High Efficiency Urinals	0
e. Non-Water Urinals	0
f. Commercial Clothes Washers (coin-op only; not industrial)	0
g. Cooling Tower Controllers	0
h. Food Steamers	0
i. Ice Machines	0
j. Pre-Rinse Spray Valves	0
k. Steam Sterilizer Retrofits	0
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The District has particiapted in a Commercial, Industrial, and Institutional (CII) Water Audit Program with Metropolitan Water District and Calleguas Municipal Water District. At that time, the consultants doing the the surveys reviewed our database and determined which customers would benefit from the audits and which audits would most likely be cost effective and result in recommendations to facilitate substantial water savings. Audits were performed for those customers agreeing to participate in the program. Most of these customers have implemented the recommendations made by the consultants. Currently the District offers requests for review of water allocations, which are used to survey the water use and Best Mangement Practices for the customer. Water audits are also offered to our customers who exceed their allocations or request an audit to help determine more efficient water use and suggest methods of water conservation.

D. Comments

Reported as of 12/24/08

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Implementation

Water Service Rate Structure Data by Customer Class

1. Single Family Residential	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 7,011,149
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 1,208,394
2. Multi-Family Residential	
a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
3. Commercial	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 688,104
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 126,250
4. Industrial	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 235,052
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 36,071
5. Institutional / Government	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 778,072
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 126,250
6. Dedicated Irrigation (potable)	
a. Rate Structure	Allocation-Based
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 1,775,360
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 306,608
7. Recycled-Reclaimed	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 279,482
c. Total Revenue from Customer	$ 4,698

Meter/Service (Fixed) Charges

8. Raw

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

9. Other

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

B. Implementation Options

Select Either Option 1 or Option 2:

1. Option 1: Use Annual Revenue As Reported
V/(V+M) >= 70%

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges

Selected

2. Option 2: Use Canadian Water & Wastewater Association Rate Design Model
V/(V+M) >= V'/(V'+M')

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges
V' = The uniform volume rate based on the signatory's long-run incremental cost of service
M' = The associated meter charge

a. If you selected Option 2, has your agency submitted to the Council a completed Canadian Water & Wastewater Association rate design model?

b. Value for **V'** (uniform volume rate based on agency's long-run incremental cost of service) as determined by the Canadian Water & Wastewater Association rate design model:

c. Value for **M'** (meter charge associated with V' uniform volume rate) as determined by the Canadian Water & Wastewater Association rate design model:

C. Retail Wastewater (Sewer) Rate Structure Data by Customer Class

1. Does your agency provide sewer service? (If YES, answer questions 2 - 7 below, else continue to section D.) yes

2. Single Family Residential

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 2,551,173
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

3. Multi-Family Residential

a. Sewer Rate Structure	Service Not Provided

b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

4. Commercial

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 401,808
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

5. Industrial

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 211,200
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

6. Institutional / Government

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 134,376
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

7. Recycled-reclaimed water

a. Sewer Rate Structure	Service Not Provided
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 12/24/08

BMP 12: Conservation Coordinator

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	no
a. Partner agency's name:	Calleguas Municipal Water District and Metropolitan Water District
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	75%
b. Coordinator's Name	Karen Goodman
c. Coordinator's Title	Conservation Coordinator
d. Coordinator's Experience in Number of Years	Conservation Coordinator for District 2 years Experience 5
e. Date Coordinator's position was created (mm/dd/yyyy)	01/01/1994
4. Number of conservation staff (FTEs), including Conservation Coordinator.	2

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	34027
2. BMP Program Implementation Expenditures	67516.8

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? — yes

a. If YES, describe the ordinance:

The ordinance states "Water Waste Prohibited: No person shall use or permit the use of District water for watering of turf, etc. in such a manner which allows water to run to waste; leaks or breaks in the distribution are ignored; operating ornamental fountains that do not recycle the water; washing of sidewalks, walkways, or driveways except as necessary for public safety; serve water in restaurants without being requested by the customer; watering or operating outdoor irrigation system between 9:00am-4:00pm, except as necessary to test the system; running of water or spraying of water onto other properties.

2. Is a copy of the most current ordinance(s) on file with CUWCC? — yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Moorpark	None this period

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	yes
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name See A.1.a	yes

2. Describe measures that prohibit water uses listed above:

Ventura County Waterworks District #1 Rules and Regulations as approved by the County of Ventura Board of Supervisors.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. — yes

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. — yes

ii.) Implement an identified maximum number of

gallons discharged per gallon of soft water produced.	yes
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	yes
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/24/08

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2007**

A. Implementation

Number of Non-Efficient Toilets Replaced With 1.6 gpf Toilets During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	no
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	20	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**20**	**0**

Number of Non-Efficient Toilets Replaced With 1.28 gpf High-Efficiency Toilets (HETs) During Report Year

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate		
8. Direct Install		
9. CBO Distribution		
10. Other		
Total		

Number of Non-Efficient Toilets Replaced With 1.2 gpf HETs (Dual-Flush) During Report Year

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate		
13. Direct Install		
14. CBO Distribution		
15. Other		
Total		

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for single-family residences.

We offer a $60 rebate for each new ULFT installed, up to a maximum of two toilets per household. Rebate is given as a credit to the customer's account after the customer provides proof that the ULFT is installed and the old toilet has been disposed of properly

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

18. Is a toilet retrofit on resale ordinance in effect for your service area? no

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Waterworks District #1 No Citations

B. Residential ULFT Program Expenditures

1. Estimated cost per replacement: $ 60

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/22/08

Water Supply & Reuse

Reporting Unit:
Ventura County Waterworks Dist. #1

Year:
2008

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Calleguas Municipal Water	11914.1	Imported
Groundwater	1493	Groundwater

Total AF: 13407.1

Reported as of 12/22/08

Accounts & Water Use

Reporting Unit Name:	Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2008**

A. Service Area Population Information:

1. Total service area population 36814

B. Number of Accounts and Water Deliveries (AF)

Type 2009 +10,174	Metered No. of Accounts	Metered Water Deliveries (AF)	Unmetered No. of Accounts	Unmetered Water Deliveries (AF)
1. Single-Family	9563	7781.8	0	0 Elaine
2. Multi-Family	0	0	0	0
3. Commercial	211	718.7	0	0
4. Industrial	71	242.5	0	0
5. Institutional	144	850.4	0	0
6. Dedicated Irrigation	173	2868.5	0	0
7. Recycled Water	1	469.3	0	0
8. Other	256	52.9	0	0
9. Unaccounted	NA	0	NA	0
Total	10419	12984.1	0	0
	Metered		**Unmetered**	

Reported as of 12/22/08

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Based on your signed MOU date, 08/27/1991, your Agency STRATEGY DUE DATE is:	08/26/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1993
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1993

B. Water Survey Data

Survey Counts:	**Single Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	4	0
2. Number of surveys completed:	4	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)		Other
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		spreadsheet
b. Describe how your agency tracks this information.		

We keep records of each survey offered, status of each survey, resultant allocation adjustments.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/22/08

BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts?	no
a. If YES, list local jurisdictions in your service area and code or ordinance in each:	
2. Has your agency satisfied the 75% saturation requirement for single-family housing units?	yes
3. Estimated percent of single-family households with low-flow showerheads:	85%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units?	no
5. Estimated percent of multi-family households with low-flow showerheads:	60%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

We keep records of each survey offered, status of each survey, resultant allocation adjustments.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices?	yes
a. If YES, when did your agency begin implementing this strategy?	01/01/1994

b. Describe your targeting/ marketing strategy.

We put a comment on our bills to advertise out "ULFT Toilet Rebate" Program. There is also information regarding available rebates on our website. Distributed low-flow showerheads at our local Country Days event.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	100	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	2	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices?	yes
a. If YES, in what format are low-flow devices tracked?	Spreadsheet

b. If yes, describe your tracking and distribution system :

We keep a database to identify all customers who receive rebates, and the number of rebates(maximum 2) for each customer. This allows us to determine the number and amount of rebates during any one year. We do not track cost of ULFTs because they are provided through CMWD. After July 2008 all information regarding rebates will be done through the Regional Rebate Program offered through MWD and CMWD.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/22/08

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2008**

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	yes
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	12514.9
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	13406.8
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.93
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	yes
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	yes
7. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Purchases and sales are tracked on a monthly basis. We perform system leak detection when our unaccounted water loss >6%, and we repair all leaks when found. O&M staff has regularly scheduled system check. We also monitor unmetered water use, such as water used in flushing and other system maintenance.

B. Survey Data

1. Total number of miles of distribution system line.	138
2. Number of miles of distribution system line surveyed.	138

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

differs from Exhibit 1 and why you consider it to be "at least as effective as." We compare production vs. consumption to be sure percentage of loss is less than 6%

D. Comments

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:		

2. Volume treated water supplied into the system:

3. Volume of water exported from the system:

4. Volume of billed authorized metered consumption:

5. Volume of billed authorized unmetered consumption:

6. Volume of unbilled authorized metered consumption:

7. Volume of unbilled authorized unmetered consumption:

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:

2. How frequently are they tested and calibrated?

3. Length of mains:

4. What % of distribution mains are rigid pipes (metal, ac, concrete)?

5. Number of service connections:

6. What % of service connections are rigid pipes (metal)?

7. Are residential properties fully metered?

8. Are non-residential properties fully metered?

9. Provide an estimate of customer meter under-registration:

10. Average length of customer service line from the main to the point of the meter:

11. Average system pressure:

12. Range of system pressures: From to

13. What percentage of the system is fed from gravity feed?

14. What percentage of the system is fed by pumping and re-pumping?

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?

2. Does your agency test, repair and replace your meters on a regular timed schedule?

a. If yes, does your agency test by meter size or customer category?:

b. If yes to meter size, please provide the frequency of testing by meter size:

Less than or equal to 1"

1.5" to 2"

3" and Larger

c. If yes to customer category, provide the frequency of testing by customer category:

SF residential

MF residential

Commercial

Industrial & Institutional

3. Who is responsible for repairs to the customer lateral or customer service line?

4. Who is responsible for service line repairs downstream of the customer meter?

5. Does your agency proactively search for leaks using leak survey techniques or does your utility reactively repair leaks which are called in, or both?

6. What is the utility budget breakdown for:

Leak Detection	$
Leak Repair	$
Auditing and Water Loss Evaluation	$
Meter Testing	$

H. Comments

Reported as of 12/22/08

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Does your agency have any unmetered service connections?	No
a. If YES, has your agency completed a meter retrofit plan?	
b. If YES, number of previously unmetered accounts fitted with meters during report year:	
2. Are all new service connections being metered and billed by volume of use?	Yes
3. Are all new service connections being billed volumetrically with meters?	Yes
4. Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?	No

5. Please fill out the following matrix:

Account Type	Number of Metered Accounts	Number of Metered Accounts Read	Number of Metered Accounts Billed by Volume	Billing Frequency Per Year	Number of Volume Estimates
a. Single Family	9563	9563	9563	6	0
b. Multi-Family	0	0	0	6	0
c. Commercial	211	211	211	6	0
d. Industrial	71	71	71	6	0
e. Institutional	144	144	144	6	0
f. Landscape Irrigation	173	173	173	12	0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	
b. Describe the feasibility study:	
2. Number of CII accounts with mixed-use meters:	304
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.	0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2008**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	719
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	719
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	719
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	719
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	01/01/1994
b. Description of marketing / targeting strategy:	

District has contracted with a consultant to perform large landscape water audits for high use customers who exceed their allocations. At the time of billing. top water users are identified. Upon review of their accounts, if warranted, these customers are sent applications to request a review of their allocations. If a review of the account history and the information provided in the application suggests above normal water consumption, the customer will be offered a water audit. The audit will help determine the appropriateness of the allocation, and also used to determine methods of water conservation. We also offered a California Friendly Landscape training class to our customers.

2. Number of Surveys Offered during reporting year.	30
3. Number of Surveys Completed during reporting year.	6
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes
a. If YES, describe below:	

We review the water use to confirm efficient water use. If customer continues having a problem being efficient, we offer a follow up audit to determine whether the conservation recommendations have been implemented and to review irrigation schedules.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey	yes

program.

Does your agency provide mixed-use accounts with landscape budgets?	
2. Number of CII mixed-use accounts with landscape budgets.	23
Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. (From BMP 4 report)	0
Total number of change-outs from mixed-use to dedicated irrigation meters since Base Year.	
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	no

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services?	yes

a. If YES, describe below:

The Ventura County Water Conservation Program coordinated efforts of numerous individuals and agencies on the Water Conservation Landscape Task Force to prepare the Landscape Design Criteria to comply with AB 325, Water Conservation in Landscaping Act. The Ventura County Board of Supervisors and the Board of Directors for the Ventura County Waterworks District No. 1 adopted the criteria in October 1992. The criteria use the water budget approach. We also have a variety of brochures available that detail plant water requirements and preferred irrigation practices, including "Sustainable Landscaping: Resource Efficient Landscape for the Central Coast," "Top Ten Ways to Conserve Water," and the County's "Landscape Design Criteria."

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	yes
7. Do you provide customer notices at the start of the irrigation season?	yes
8. Do you provide customer notices at the end of the irrigation season?	yes

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 12/22/08

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2008**

A. Coverage Goal

	Single Family	Multi-Family
1. Number of **residential** dwelling units in the agency service area.	9,106	0
2. Coverage Goal =	= **699 Points**	

B. Implementation

1. Does your agency offer rebates for **residential** high-efficiency washers? yes

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
2. **Greater than 8.5 but not exceeding 9.5** (1 point)	0	$ 0	$ 0	$ 0	$ 0	0
3. **Greater than 6.0 but not exceeding 8.5** (2 points)	0	$ 0	$ 0	$ 0	$ 0	0
4. **Less than or equal to 6.0** (3 points)	24	$ 440	$ 3,165	$ 0	$ 3,605	72
TOTALS:	**24**	**$ 440**	**$ 3,165**	**$ 0**	**$ 3,605**	**72**

C. Past Credit Points

For HEW incentives issued before July 1, 2004, select ONE of the following TWO options:

- Method One: Points based on HEW Water Factor
- Method Two: Agency earns 1 point for each HEW.

PAST CREDIT TOTALS:	**0**	**$ 0**	**0**

D. Rebate Program Expenditures

1. Average or Estimated Administration and Overhead $ 0

2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW? yes

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Participating in the MWD Regional Rebate Program which started July 2008

Reported as of 12/22/08

BMP 07: Public Information Programs

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. How is your public information program implemented?
   Wholesaler and retailer both materially participate in program
   Which wholesaler(s)?
   Wholesaler and retailer both participate in program

2. Describe the program and how it's organized:
   Public Information Messages on bills regarding Ultra Low Flush Toilet (ULFT) rebate program (finished in 7/2008)seasonal tiers, conservation tips indoors and outdoors. 2. Brochures regarding water saving tips, waterwise garding, High Efficiency Toilets and Washers and seed give aways etc. at customer service desk. 3. Gardens at the main entry to our customer service office and in the courtyard were planted with drought-resistant plants and designed to demonstrate the beauty of such plants. 4. "Water Awareness Month" activities including an annual "Water Awareness" poster contest. 5. Bill compares current usage to use during the same time period in the previous year. 6. Annual Water Quality Report 7. Paticipation in Local Country Days Event, giveaway conservation, educational items, low flow shower heads. 8. Bill inserts on Landscape training classes and conservation.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	6
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	0
f. Special Events, Media Events	yes	4
g. Speaker's Bureau	no	
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing) 4250

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2008**

A. Implementation

1. How is your public information program implemented?
   Wholesaler implements program (none or minimal retailer participation)
   Which wholesaler(s)?
   Wholesaler and retailer both participate in program MWD, CMWD

Public Information Program Activity Reported By Wholesaler

BMP 09: Conservation Programs for CII Accounts

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period: no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	1	0	6
b. Number of New Surveys Completed	0	0	3
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit			yes
f. Evaluation of all water-using apparatus and processes			yes
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives			yes

Agency CII Customer Incentives	Budget ($/Year)	# Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this no

option?

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	no

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	0
b. Dual Flush Toilets	0
c. High Efficiency Toilets	0
d. High Efficiency Urinals	0
e. Non-Water Urinals	0
f. Commercial Clothes Washers (coin-op only; not industrial)	0
g. Cooling Tower Controllers	0
h. Food Steamers	0
i. Ice Machines	0
j. Pre-Rinse Spray Valves	0
k. Steam Sterilizer Retrofits	0
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The District has particiapted in a Commercial, Industrial, and Institutional (CII) Water Audit Program with Metropolitan Water District and Calleguas Municipal Water District. At that time, the consultants doing the the surveys reviewed our database and determined which customers would benefit from the audits and which audits would most likely be cost effective and result in recommendations to facilitate substantial water savings. Audits were performed for those customers agreeing to participate in the program. Most of these customers have implemented the recommendations made by the consultants. Currently the District offers requests for review of water allocations, which are used to survey the water use and Best Mangement Practices for the customer. Water audits are also offered to our customers who exceed their allocations or request an audit to help determine more efficient water use and suggest methods of water conservation.

D. Comments

BMP 11: Conservation Pricing

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

Water Service Rate Structure Data by Customer Class

1. Single Family Residential

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 6,959,738
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 1,082,515

2. Multi-Family Residential

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

3. Commercial

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 666,225
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 94,132

4. Industrial

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 230,713
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 31,337

5. Institutional / Government

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 620,327
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 94,132

6. Dedicated Irrigation (potable)

a. Rate Structure	Allocation-Based
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 1,605,417
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 235,329

7. Recycled-Reclaimed

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 298,989
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 4,698

8. Raw

a. Rate Structure	Service Not Provided

b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

9. Other

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

B. Implementation Options

Select Either Option 1 or Option 2:

1. Option 1: Use Annual Revenue As Reported
V/(V+M) >= 70%

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges

Selected

2. Option 2: Use Canadian Water & Wastewater Association Rate Design Model
V/(V+M) >= V'/(V'+M')
V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges
V' = The uniform volume rate based on the signatory's long-run incremental cost of service
M' = The associated meter charge

a. If you selected Option 2, has your agency submitted to the Council a completed Canadian Water & Wastewater Association rate design model?

b. Value for **V'** (uniform volume rate based on agency's long-run incremental cost of service) as determined by the Canadian Water & Wastewater Association rate design model:

c. Value for **M'** (meter charge associated with V' uniform volume rate) as determined by the Canadian Water & Wastewater Association rate design model:

C. Retail Wastewater (Sewer) Rate Structure Data by Customer Class

1. Does your agency provide sewer service? (If YES, answer questions 2 - 7 below, else continue to section D.)	yes

2. Single Family Residential

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 2,702,902
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

3. Multi-Family Residential

a. Sewer Rate Structure	Service Not Provided
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

4. Commercial

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 464,232

c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

5. Industrial

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 226,872
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

6. Institutional / Government

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 109,848
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

7. Recycled-reclaimed water

a. Sewer Rate Structure	Service Not Provided
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 12/22/08

BMP 12: Conservation Coordinator

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	no
a. Partner agency's name:	Calleguas Municipal Water District and Metropolitan Water District
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	75%
b. Coordinator's Name	Karen Goodman
c. Coordinator's Title	Conservation Coordinator
d. Coordinator's Experience in Number of Years	Conservation Coordinator for District years Experience 6
e. Date Coordinator's position was created (mm/dd/yyyy)	01/01/1994
4. Number of conservation staff (FTEs), including Conservation Coordinator.	2

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	37927.5
2. BMP Program Implementation Expenditures	67516.8

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/22/08

BMP 13: Water Waste Prohibition

Reporting Unit: **Ventura County Waterworks Dist. #1**	BMP Form Status: **100% Complete**	Year: **2008**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

   a. If YES, describe the ordinance:

   The ordinance states "Water Waste Prohibited: No person shall use or permit the use of District water for watering of turf, etc. in such a manner which allows water to run to waste; leaks or breaks in the distribution are ignored; operating ornamental fountains that do not recycle the water; washing of sidewalks, walkways, or driveways except as necessary for public safety; serve water in restaurants without being requested by the customer; watering or operating outdoor irrigation system between 9:00am-4:00pm, except as necessary to test the system; running of water or spraying of water onto other properties.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

   a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

   City of Moorpark None this period

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	yes
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name See A.1.a	yes

2. Describe measures that prohibit water uses listed above:

   Ventura County Waterworks District #1 Rules and Regulations as approved by the County of Ventura Board of Supervisors.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	yes

   c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to

ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	yes
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Ventura County Waterworks Dist. #1	**100% Complete**	**2008**

A. Implementation

Number of Non-Efficient Toilets Replaced With 1.6 gpf Toilets During Report Year

	Single-Family Accounts	**Multi-Family Units**
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	no
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	13	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**13**	**0**

Number of Non-Efficient Toilets Replaced With 1.28 gpf High-Efficiency Toilets (HETs) During Report Year

	Single-Family Accounts	**Multi-Family Units**
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	no
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate	24	0
8. Direct Install	0	0
9. CBO Distribution	0	0
10. Other	0	0
Total	**24**	**0**

Number of Non-Efficient Toilets Replaced With 1.2 gpf HETs (Dual-Flush) During Report Year

	Single-Family Accounts	**Multi-Family Units**
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	no
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	0	0
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0
Total	**0**	**0**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for single-family residences.

We offered a $60 rebate for each new ULFT installed, up to a maximum of two toilets per household. Rebate is given as a credit to the customer's account after the customer provides proof that the ULFT is installed and the old toilet has been disposed of properly. New Regional Rebate Program started in July 2008 rebates for UFLT no longer avaialble. Rebates on HET 1.28 gpf are $185.00 avaiable if replacing non-efficient toilets, with an new HET. A rebate of $50.00 available if replacing ULFT with HET.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

18. Is a toilet retrofit on resale ordinance in effect for your service area? no

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Waterworks District #1	No Citations

B. Residential ULFT Program Expenditures

1. Estimated cost per replacement: $ 60

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

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The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Base Year Data

Link to FAQs

Reporting Unit Base Year

Base Year: 2008

What is your reporting period? Fiscal

BMP 1.3 Metering

Number of unmetered accounts in Base Year: 0

BMP 3.1 & BMP 3.2 & BMP 3.3 Residential Programs

Number of Single Family Customers in Base Year: 9,563

Number of Multi Family Units in Base Year: 0

BMP 3.4 WaterSense Specification (WSS) Toilets

Number of Single Family Housing Units constructed prior to 1992: 5020

Number of Multi Family Units prior to 1992: n/a

Average number of toilets per single family household: 2

Average number of toilets per multi family household: n/a

Five year average resale rate of single family households: 158/Avg sale $506,250

Five-year average resale rate of multi family households: n/a

Average number of persons per single family household: 4

Average number of persons per multi family household: 0

BMP 4.0 & BMP 5.0 CII & Landscape

Total water use (in Acre Feet) by CII accounts: 862.17

Number of accounts with dedicated irrigation meters: 24

Number of CII accounts without meters or with Mixed Use Meters: 280

Number of CII accounts: 304

Comments:

At this time can not break out Single Family Residences/Multi-Family Units information into separate lists.
Average resale rate is for last 3 1/2 years.

version 1.0

The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

Service Area Population: 36,786

2009

Non- Potable Water

If you select Other for type, enter

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Moorpark Wastewater Treatment Pl	426.20	Recycled Non Potable	Recycled Water
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
		Other	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
	AF/YEAR	Select a water type.	
		Select a water type.	

Exported Water Name	AF/YEAR	Where Exported? such as groundwater recharge, retail,
None		

The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

Water Uses 2009

Non-Potable Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other	1.00	426.20	0.00	0.00	Recycled Water
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

Non-Potable Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other	0.00	0.00	0.00	0.00	N/A
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

WATER SOURCES

Service Area Population: 36,786

2009

Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Local Wells	2,109.40	Groundwater	Local Wells
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Calleguas Municipal Water District	10,265.90	Other	Imported
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
	AF/YEAR	Other	
		Other	

Exported Water Name	AF/YEAR	Where Exported?

The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

Water Uses 2009

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Single-Family	9,670.00	7,235.00	0.00	0.00	Includes Multi-Family
Multi-Family	0.00		0.00	0.00	
Commercial	181.00	358.27	0.00	0.00	
Industrial	62.00	208.30	0.00	0.00	
Institutional	65.00	267.94	0.00	0.00	
Dedicated Irrigation	0.00		0.00	0.00	
Agricultural	173.00	2,943.00	0.00	0.00	Includes Dedicated Irrigation
Other	14.00	14.30			Incl. construction, hydrant, and fire lines
Other					
Other					
Other					
Other					
Other					

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other		0			
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name) VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

2009

BMP 1.1 Operations Practices

Comments:

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Conservation Coordinator

Conservation Coordinator (•) Yes ( ) No

Contact Information

First Name: BILL

Last Name: LYKINS

Title: STAFF SERVICES SPECIALIST

Phone: 805 378 3011

Email: bill.lykins@ventura.org

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
c. Support legislation or regulations that prohibit water waste
d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
e. Support local ordinances that prohibit water waste
f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description.

File name(s): Email files to natalie@cuwcc.org Ventura County Waterworks Districts # 1,16,17,19, Water Conservation Rules and Regulations

Web address(s) URL: comma-separated list http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/WaterSanitation/Ventura%20Count

Enter a description: Ventura County Waterworks District Rules and Regulations, Part 1 - Section L Permanent Water Conservation Measures:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

View MOU

2009 BMP 1.2 Water Loss Control

Did your agency complete a pre-screening system audit in 2009? Yes (●) No ( )

If yes, answer the following:

Determine metered sales in AF: 11,752.40

Definition: other accountable uses not included in metered sales, such as unbilled water use, fire suppression, etc.

Determine system verifiable uses AF: 11,752.40

Determine total supply into the system in AF: 12,375.20

Does your agency keep necessary data on file to verify the answers above? Yes (●) No ( )

Did your agency complete a full-scale system water audit during 2009? Yes ( ) No (●)

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC? Yes ( ) No (●)

Did your agency operate a system leak detection program? Yes (●) No ( )

Comments:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

BMP 1.3 Metering with Commodity

Link to FAQs

See the complete MOU: View MOU

See the coverage requirements for this BMP: ?

Implementation

Does your agency have any unmetered service connections? ○ Yes ◉ No

If YES, has your agency completed a meter retrofit plan? ◉ Yes ○ No

Enter the number of previously unmetered accounts fitted with meters during reporting year: 0

Are all new service connections being metered? ◉ Yes ○ No

Are all new service connections being billed volumetrically? ◉ Yes ○ No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? ○ Yes ◉ No

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# of estimated bills/yr
Single-Family	9,670	9,670	9,670	Bi-monthly	6
Commericial	315	315	315	Bi-monthly	6
Industrial	69	69	69	Bi-monthly	6
Agricultural	173	173	173	Bi-monthly	6
Institutional	66	66	66	Bi-monthly	6
Other	14	14	14	Bi-monthly	6
Other				Other	
Other				Other	
Other				Other	
Other				Other	

Number of CII Accounts with Mixed-use Meters: 282

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? ○ Yes ◉ No

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted

B. Email or provide a link to the feasibility study (or description of):

File name(s): Email files to natalie@cuwcc.org Enter the file name here e.g. WaterWastePreventionOrdinance

Web address(s) URL: comma-separated list Enter the URL to your documentation.

General Comments about BMP 1.3:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

View MOU

BMP 1.4 Retail Conservation Pricing

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to natalie@cuwcc.org.

2009

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Allocation Based		8.044.104.35	
Allocation Based		752.044.74	
Allocation Based		215.337.98	
Allocation Based		767.505.44	
Allocation Based		1.993.829.06	
Select a Rate Struc			1.541.509.74
Select a Rate Struc			

Implementation Option (Conservation Pricing Option)

(•) Use Annual Revenue As Reported

( ) Use Canadian Water & Wastewater Association Rate Design Model

If CWWA is select, enter the file name and email the spreadsheet to natalie@cuwcc.org

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service (•) Yes ( ) No

Select the Retail Waste Water(Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform		0.00	2.784.960.00
Uniform		0.00	459.072.00
Uniform		0.00	124.416.00
Uniform		0.00	218.592.00
Select a Rate Struc			
Select a Rate Struc			
Select a Rate Struc			

Comments:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

CUWCC

Link to FAQs

2009

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Is a Wholesale Agency Performing Public Outreach?

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? (•) Yes ( ) No

Enter the name(s) of the wholesale agency (comma delimited): Metropolitan Water District, Calleguas Municipal Water District

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Public Contacts	Public Information Programs
12	Landscape water conservation media campaigns
12	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
6	General water conservation information
24	Website
	Select a public contact

Contact with the Media

Are there one or more wholesale agencies performing media outreach which can be counted to help your agency comply with the BMP? (•) Yes ( ) No

Enter the name(s) of the wholesale agency (comma delimited): Metropolitan Water District, Calleguas Municipal Water District

OR Retail Agency (Contacts with the Media)

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Media Contacts	Did at least one contact take place during each quarter of the reporting year?	Media Contact Types
1	News releases	
12	Radio contacts	
12	Television contacts	
	Select a type of media contact	
	Select a type of media contact	
	Select a type of media contact	

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ○ Yes ⊙ No

Enter the name(s) of the wholesale agency (comma delimited)

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/WaterSanitation/water_conservation

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Additional web site: www.venturawatersavingsplants.com - Rebate Program Updates/Seasonal Sprinkler Adjustment Info. Permanent Water Conservation Rules and Rgulations Updates/Notifications of Waterwise Gardener classes/Rate/Allocation changes/Watering times changes.

Did at least one Website Update take place during each quarter of the reporting year? ⊙ Yes ○ No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	
Conservation	$20,000		☐		
			☐		
			☐		
			☐		
			☐		
			☐		

Monthly water use reports with comparison of water use previous year's billing to current, customer notification if water use unusually high.. Some examples: Billi

The fields in red are required.

Primary contact:

Agency name: VENTURA COUNTY WATERWORKS

First name: Bill

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Last name: Lykins

Reporting unit number: 233

Email: bill.lykins@ventura.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

CUWCC

Link to F..s

2009

BMP 2.1 Public Outreach Cont'd

View MOU

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?
Workshop	$3,708	☐ If yes, check the check box.
Website	$4,188	☐
Local Fair	$125	☐
		☐

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ⦿ Yes ○ No

Public Outreach Additional Information

Public Information Programs	Importance

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ○ Yes ⦿ No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ○ Yes ⦿ No

Market Research Topic	
Brand Message	
Brand Mission Statement	

Community Committees

Do you have a community conservation committee? ○ Yes ◉ No

Enter the names of the community committees: Did meet with the City of Moorpark to discuss AB 1881

Training

Training Type	# of Trainings	# of Attendees	Description of Other

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description

Partnering Programs - Partners

Name	Type of Program
☐ CLCA?	
☐ Green Building Programs?	
☐ Master Gardeners?	
☐ Cooperative Extension?	
☐ Local Colleges?	
☑ Other	Local Cities througout Ventura County participated in a water wise gardening web site

☐ Retail and wholesale outlet; name(s) and type(s) of programs:

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Members of our local water user's efficiency group meet quarterly to discuss local water issues and try to find county-wide projects that we could partner on.
We reviewed a partnership with Master Gardeners didn't fulfil our needs. SEE COMMENTS

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new

Customer Service entrance and gardens at facilities are planted with drought resistant and California native plants.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

N/A

Comments:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

CUWCC

Link to FAQs

2009

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Is your agency implementing school programs which can be counted to help another agency comply with this BMP? ⊙Yes ○No

Enter Wholesaler Names, separated by commas: Metropolitan Water District

☑ Materials meet state education framework requirements?

Description of Materials: Curriculum Materials include teacher study guide and student workbooks.

☑ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students: Water wisdom - curriculum for grades 4-8, Teachers guide for hands on water activities, literature, conserving water at home guide for parents grades K-5, Know what we use - Water Wisely, conservation rulers,

Number of students reached: 6,780

☑ Materials distributed to 7-12 Students?

Description of materials distributed to 7-12 Students:

Number of Distribution:

Annual budget for school education program: $10,000.00

Description of all other water supplier education programs: Distribution of education conservation materials through local fair, traveling student poster Art Exhibit, Annual Poster Competition.

School Program Activities

Classroom presentations:

Number of presentations: 3

Number of attendees:

Large group assemblies:

Number of presentations: 1

Number of attendees: 350

Children's water festivals or other events:

Number of presentations: 0

Number of attendees:

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations: 0

Number of attendees:

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description |
---|---
|

Number distributed |

Staffing children's booths at events & festivals:

Number of booths | 1 | Number of attendees | 4,000

Water conservation contests such as poster and photo:

Description | Annual Poster Competition

Number distributed | 6780

Offer monetary awards/funding or scholarships to students:

Number Offered | 0 | Total Funding |

Teacher training workshops:

Number of presentations | 0 | Number of attendees |

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips | 0 | Number of participants |

College internships in water conservation offered:

Number of internships | 0 | Total funding |

Career fairs/workshops:

Number of presentations | 0 | Number of attendees |

Additional program(s) supported by agency but not mentioned above:

Description |

Number of events (if applicable) | 0 | Number of participants |

Total reporting period budget expenditures for school education programs (include all agency costs): 1,389.00

Comments

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS DISTRICT

Reporting unit name (District name): VENTURA COUNTY WATERWORKS DISTRICT

Reporting unit number: 233

Primary contact:

First name: BILL

Last name: LYKINS

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

View MOU

2009

BMP 3 Residential

○ **Traditional (Sections A - D)**   ○ **Flex Track (All Sections)**

For Traditional Track please answer the fields within the traditional boxes.
For Flex Track option, please answer the fileds within the flex track boxes.
You must enter all measured water savings manually. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in form which are necessary to show that the measure was implemented as described.

A) Residential Assistance / Leak Detection

Flex Track

Traditional

	Single Family	Multi Family	Total Water Savings AF/YR	Measured Water Savings AF/YR
Total Number of Accounts	9,670.00	0.00		
Total Number of Participants Overall	9,670.00	0.00		
Total Number of Leak Det Surveys	0.00	0.00		
Total Number of Showerheads	300.00	0.00		
Total Number of Faucet Aerators	0.00	0.00		
Total Number of Landscape Water Survey	0.00	0.00		

Number of Other Components: 0.00

Description of Other Components Distributed: N/A

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

B) High Efficiency Clothes Washers (HECWs)

Flex Track

Traditional

Number of incentives for HECWs with an AVERAGE Water Factor of 5.0: 128.00

Are Financial incentives provided for HECWs ? ⊙ Yes ○ No

Has your Agency completed a HECW Market Penetration Study
(this question does not impack your coverage report, purely informational) ○ Yes ⊙ No

HECW Market Penetration Study Documents (Enter the file name and Email file to Natalie@cuwcc.org)

Measured water savings (AF/Year)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

C) WaterSense Specification (WSS) Toilets

(Agency must complete information for at least one coverage option (For Traditional 1, 2, or 3; For Flex Tarck 1, 2, 3, or 4).
You are encouraged to include information on other coverage options, as available.
If seeking credit for additional water savings, you must select Flex Track option)

Traditional

Flex Track

1. Retrofiton Resale Ordinanceis in Place ○ Yes ⊙ No

If Yes, Choose A File (Enter the file name and Email file to Natalie@cuwcc.org)

2. A 75% Market Saturation Achieved ○ Yes ⊙ No

If yes, Choose A File (Enter the file name and Email file to Natalie@cuwcc.org)

3. WSS Toilets Installed

	Single Family	Multi Family
Number of WSS Toilets Installed	38.00	0.00
Measured Water Savings AF/YR		

4. Non-WSS Toilets

	Single Family		Multi Family	
Type of Toilets	Number of Toilets	Water Savings	Number of Toilets	Water Savings
Other				

Description of Other Non-WSS Type of Toilets

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

D) WSS for New Residential Development

(Agency must complete information for at least one coverage option.You are encouraged to include information on other coverageoptions, as available. If seeking credit for additional water savings you must select the Flex Track option)

Traditional

	Single Family		Multi Family	
Residential development Rebates	Yes ○	No ⦿	Yes ○	No ⦿
Recognition Programs	Yes ○	No ⦿	Yes ○	No ⦿
Reduced connection Fees	Yes ○	No ⦿	Yes ○	No ⦿
Ordinances	Yes ○	No ⦿	Yes ○	No ⦿

New Development Ordinance
(Enter the file name and Email file to Natalie@cuwcc.org)

Number of new Single Family Units built in Service Area: 37.00

Number of new Multi Family Units built in Service Area: 0.00

Flex Track

In the following table, enter one row for each incentive typr program you offer

List of Incentive Amount

Incentive Type	Incentive Amount	Number of WSS fixtures installed	Number of Participating Single Family	Number of Participating Multi Family	Measured Water Savings Single Family	Measured Water Savings Multi Family
HECW	120.00	128.00	127.00	0.00	3.99	
HET	70.00	38.00	23.00	0.00	1.48	
Rotate Nozzle	8.00	162.00	3.00	0.00	0.71	
Synthetic Turf	0.25	3,962.00	4.00	0.00	0.55	
(Square Feet)						
WBIC	105.00	1.00	1.00	0.00	1.30	

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

For Traditional Option, Stop Here, do not go further.
For Flex Track Option, please continue...

Flex Track Menu Options

In addition to the measures on the BMP List, the Flex Track menu options may be implemented to meet the savings goal for this BMP. Fill in the water savings measures that your agency has implemented.

E) High bill contact with single-family and multi-family customers

Measured water savings (AF/Year)

Select the Types of Contact:

☐ Email ☐ Phone ☐ Letter ☐ Others (describe)

Upload sample of contact contents (email, letter, etc.)
– if applicable; enter the file name and email file to Natalie@cuwcc.org

Who initiated the contact: (Please Specify customer, agencies, or both)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to Natalie@cuwcc.org)

F) Educate residential customers about the behavioral aspects of water conservation

Measured water savings (AF/Year)

Select types of educational methods used:	**# Events**	**# Customers Reached**
☐ Workshop		
☐ Community Event		
☐ Letter		
☐ On-Site Visit		
☐ Phone Call		
☐ Water Survey		
☐ Website Hit		
☐ Door Hanger		
☐ Other (Describe)		

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

G) Notify residential customers of leaks on the customer's side of the meter

Type of Notification (Describe)

How many were sent out?

Upload sample notification method(email, letter, etc.) – if applicable

(Enter the le name and Email le to Natalie@cuwcc.org

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the le name and Email le to Natalie@cuwcc.org)

H) Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.

Number of Leaks Repaired

Number of bill adjustments/credits/refunds provided

Describe here or upload a document with a policy description below:

Measured water savings (AF/Year)

0.00

Upload file describing Policy (Enter the file name and Email file to Natalie@cuwcc.org)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

I) Provide unique water savings fixtures that are not included in the BMP list above

Fixture or Device	Description	Quantity Installes	Measured water savings (AF/YR)
None			

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

J) Install residence water use monitors.

Type of Monitor	Brand	Number Installed	Measured water savings (AF/Year)
☐ Dashboard			0.00
☐ Leak Detector			
☐ Data Logger			

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

K) Participate in programs that provide residences with school water conservation kits.

Number of Kits Distributed

Kit contents (including model of fixtures)

List of what was actually installed in the homes (number of showerheads, aerators etc.).

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

L) Implement an automatic meter reading program for residential customers.

AMR or AMI: Select an Option

Type of Network: Select an Option

Number of connections installed

☐ Is your agency using these to contact high water-use customers?

Measured water savings (AF/Year): 0.00

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

OTHER Types of Measures.

Type of Program	Sample / Description	Measured Water Savings (AF/YR)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

Comments

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

2009

Link to FAQs

View MOU

BMP 4 CII

Traditional (Section A - L)

Flex Track (All Sections)

For Traditional Track please answer the fields within the traditional boxes.

For Flex Track option, please answer the fileds within the flex track boxes.

You must enter all measured water savings manually in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings was measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

CII Type of measure implemented

Traditional

A) High - Efficiency Toilets.

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? Yes No

Council's Annual Water Savings 0.041748 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

B) High - Efficiency Urinals (0.5 gpf)

Flex Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.069086 AF per device

If not, Please provide the following

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

C) Ultra Low Volume Urinals (0.125 gpf)

Flex Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.080603 AF per device

If not, Please provide the following

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

D) Zero Consumption Urinals (0.0 gpf)

Flex Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time..

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes ○ No

Flex Track

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

Council's Annual Water Savings 0.0921146 AF per device

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

E) Commercial High - Efficiency Single Load Clothes Washers

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Counsil's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.116618 AF per device

If not , Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

F) Cooling Tower Conductivity Controllers.

Traditional

Number: 0

Type of program: Other

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 1.032250 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

G) Cooling Tower pH Controllers

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 3.981543 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

H) Connectionless Food Steamers.

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.25 AF per Steamer Compartment

mIf not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

I) Medical Equipment Steam Sterilizers

Flax Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 1.538 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

J) Water - Efficient Ice Machines.

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time..

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.0834507 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

K) Pressurized Water Brooms.

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.1534 AF per device

Flex Track

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

L) Dry Vacuum Pumps.

Traditional

Number: 0

Type of program: Other

Other type of program: Do not have a CII rebate Program at this time..

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes ○No

Council's Annual Water Savings 0.064 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Traditional Reporting Stop Here, Do not continue

Flex Track Reporing Please Continue...

M) Industrial Process Water Use Reduction.

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Type of Process Water Reduced

If re-using water, what was the secondary use of the water? (such as pre-rince cycle or landscaping)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

N) Commercial Laundry Retrofits.

Number of customers

Measured water savings (AF/Year)

Type of customer

- ☐ hotels
- ☐ campuses
- ☐ prisons
- ☐ laundromats

Lease / own machines — ○ Lease ○ Own Machines ○ Both

Type of program — Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

O) Industrial Laundry Retrofits.

Measured water savings (AF/Year)

Total Number of customers

Total Volume of laundry processed annually — Select an Option

Type of program — Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

P) Filter Upgrades (for pools, spas, and fountains).

Number of pools upgraded

Number of spas upgraded

Number of fountains upgraded

Measured water savings (AF/Year)

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Q) Car Wash Reclamation Systems

Measured water savings (AF/Year)

	Conveyor	In-bay
Total Number of program participants (accounts)		
Total Number of vehicles washed annually		

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.00004607 (or 15 gals) per vehicle

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

R) Wet Cleaning.

Brief description of program

Measured water savings (AF/Year)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

S) Water Audits (To avoid double counting, do not include device/replacement water savings.)

Number of water audits by type of business

Measured water savings (AF/Year)

Auto

Food

Health

Hotels

Manufacturing

Membership

Multi-use

Office

Religious

Restaurant

Retail/
Wholesale

School

Other (with
description)

Description of
Other

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

T) Clean In Place (CIP) Technology
(such as bottle sterilization in a beverage processing plant)

Measured water savings (AF/Year)

Number of customers

Type of program Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

U) Waterless Wok

Number

Type of program: Select an Option

Measured water savings (AF/Year)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

V) Alternative On-site Water Sources (For Rain Water Harvesting, commercial rain barrels are excluded. For Foundation Drain Water, exclude permeable paving.)

Measured water savings (AF/Year)

Select type	Number	Description
☐ Cooling Condensate		
☐ Foundation Drain Water		
☐ Gray Water		
☐ Storm Water		
☐ Rain Water		
☐ Pond and Water Feature Recycling		

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

W) Sub - metering

Measured water savings (AF/Year)

Select type | Number | Description

☐ Condominiums

☐ Apartments

☐ Mobile Homes

Do you accept the Council's default savings numbers for this measure? ○ Yes ○ No

Council's Annual Water Savings
Appartments & Condos=0.024419 AF/YR
Mobile Home = 0.056774 AF/Yr

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

X) High Efficiency Showerheads

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Y) Faucet Flow Restrictors

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Z) Water Efficient Dishwashers

Measured water savings (AF/Year)

Select type | Number

☐ Rack

☐ Conveyor

☐ Other

Description of Other

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

AA) Hot Water on Demand

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

BB) Pre-rinse Spray Valves of 1.3 gpm (gallons per minute) or less

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

CC) Central Flush Systems

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

Other Measures chosen by the Agency

Measured water savings (AF/Year)

Description of program

Sample (if applicable)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

View MOU

2009

BMP 5 Landscape

◉ **Traditional** ○ **Flex Track**

For Traditional Track please answer the fields within the traditional boxes.
For Flex Track option, please answer the fileds within the flex track boxes.
You must enter all measured water savings manually. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data point salso requested in form which are necessary to show that the measure was implemented as described.

Accounts with Dedicated Irrigation Meters

Flex Track

Traditional

Number of dedicated irrigation meter accounts	464.00
Number of dedicated irrigation meter accounts with water budgets	372.00
Aggregate water use for dedicated non-recreational landscape accounts with budgets	4,549.10
Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	7,024.97
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	◉ Yes ○ No

Water Savings from Accounts with dedicated irrigation meters with water budgets (Acre Feet):

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

Technical Assistance

Flex Track

Traditional

Number of Accounts 20% over-budget	30.00
Number of accounts 20% over-budget offered technical assistance	30.00
Number of accounts 20% over-budget accepting technical assistance	3.00

Measured water savings (AF/Year): Not Available

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

Irrigation Water Use Surveys for Mixed-use and Un-metered Accounts

Flex Track

Traditional

Number of mixed use and un-metered accounts	9,783.00	
Number of irrigation water use surveys offered (cumulative, all years)	1,000.00	
Number of irrigation water use surveys accepted (cumulative)	50.00	
Can your Agency estimate the amount of landscape acreage for mixed use and Un-metered accounts	○ Yes ⊙ No	
If Yes, Aggregate acreage for mixed use and Un-metered accounts		
Esrimated water demand from acreage for mixed use and Un-metered accounts		
Annual water savings by customers receiving irrigation water savings surveys and implementing recomendations		

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

Financial Incentives

Flex Track

Traditional

Have you implemented and maintained an irrigation equipment retrofit incentive program? ○ Yes ⊙ No

Number of incentives	Dollar value of incentives	Incentive Types	Measured Water Savings (AF/YR)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to Natalie@cuwcc.org)

Traditional Reporting Stop Here, Do not continue

Flex Track Reporing Please Continue...

Landscape Flex Track Measure Types

1. Monitor and report on landscape water use

A) Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules (such as faxes, twitter, etc. not included in the previous sections).

Measured water savings (AF/Year)

Enter the Number of sites with:

Dedicated Mixed Meters

Water Budgets

Landscape Measurements

Others (describe)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Measured water savings (AF/Year)

Enter the Number of sites with:

Dedicated Mixed Meters

Water Budgets

Landscape Measurements

Others (describe)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

C) Establish agency-wide water budget. (Note that: ETo based water budget in the MWELO changed in 2010 from .8ETo to .7ETo.)

Measured water savings (AF/Year)

Agency-wide total irrigated area (Acres)

Amount of Water Used (AF/Acre)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

D) Establish agency-wide, sector-based irrigation goal to reduce water use, based on seasonality.

Measured water saving (AF/Year)

Number of minimum irrigation goal (AF/Acre)

Amount of Water Used per Period (AF/Period)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

2. Provide technical landscape resources and training

A) Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

Measured water savings (AF/Year)

Enter the Number of:

Contacts In Person

Contacts over the phone

Contacts via Email

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

Measured water savings (AF/Year)

Enter the Number of:

Audits conducted per year

Measurement of square footage of Turf areas

Measurement of square footage of NON Turf areas

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

C) Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

Enter the Number of:

Events

Participants

List Type or Title of Events

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

D) Establish Time-of-Day Irrigation Restrictions.

Yes No

Describe Restrictions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

E) Establish Day-of-Week Irrigation Restrictions. Yes No

Describe Restrictions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

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3. Provide incentives

A) Establish Landscape budget-based rates. ○ Yes ○ No

Describe Rates:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

Measured water savings (AF/Year)

Number of Conversions:

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

C) Provide incentives for installing sub-meters to separate landscape water use

Number of meters installed:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

D) Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

Select types of irrigation equipment upgrades:

Number of devices installed

Measured water savings (AF/Year)

- ☐ Controllers
- ☐ Emitters
- ☐ Soil moisture sensors
- ☐ Pressure Regulators
- ☐ Rain shut off devices
- ☐ Other (describe)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

E) Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

Acreage of live turf converted to low water-using plants, artificial turf, or permeable surfaces: Acres

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

F) Provide incentives for conversions from potable to recycled water.

Number of Conversions:

Number of Incentives:

Funds Invested:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

G) Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

Number of Conversions:

Number of Incentives:

Funds Invested:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

4. Participate in local and regional planning and regulatory activities

A) Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

Measured water savings (AF/Year)

Public Information Programs List

Agency Type	Describe Involvement	If Ohter: Enter Name	Actions

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

Yes **No**

Describe Involvement:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

C) Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

◯ Yes ◯ No

Describe Involvement:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

5. Develop a holistic approach to landscape water use efficiency

A) Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

Describe Program:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

6. Other Measures

A) Other Landscape Measures.

Describe Other Landscape Measures:

Measured water savings (Af/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file Natalie@cuwcc.org)

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The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

2010

Service Area Population: 36,786

Non- Potable Water

If you select Other for type, enter

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Moorpark Wastewater Treatment Pl	426.2	Recycled Non Potable	Recycled Water
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
		Other	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
	AF/YEAR	Select a water type.	
		Select a water type.	

Exported Water Name	AF/YEAR	Where Exported? such as groundwater recharge, retail,
None		

The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

Water Uses 2010

Non-Potable Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other	1	426.2	0	0	Recycled Water
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

Non-Potable Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other	0	0	0	0	N/A
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: VENTURA COUNTY WATERWOR

Division name (Reporting unit): VENTURA COUNTY WATERWOR

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

CUWCC

WATER SOURCES

2010

Service Area Population: 36,786

Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Local Wells	2109.4	Groundwater	Local Wells
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Calleguas Municipal Water District	10265.9	Other	Imported
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
	AF/YEAR	Other	
		Other	

Exported Water Name	AF/YEAR	Where Exported?

The fields in red are required.

Agency name:	VENTURA COUNTY WATERWOR	First name:	Bill
Division name (Reporting unit)	VENTURA COUNTY WATERWOR	Last name:	Lykins
Reporting unit number:	233	Email:	bill.lykins@ventura.org

Primary contact:

CUWCC

Water Uses 2010

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Single-Family	9670	7235.0	0	0	Includes Multi-Family
Multi-Family	0		0	0	
Commercial	181	358.27	0	0	
Industrial	62	208.3	0	0	
Institutional	[illegible]	[illegible]	0	0	
Dedicated Irrigation	[illegible]	[illegible]	0	0	
Agricultural	[illegible]	[illegible]	0	0	Includes Dedicated Irrigation
Other	[illegible]	[illegible]			Incl. construction, hydrant, and fire lines
Other	[illegible]	[illegible]			
Other	[illegible]	[illegible]			
Other					
Other					
Other					

0

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other		0			
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

2010

3MP 1.1 Operations Practices

See the complete MOU: View MOU

See the coverage requirements for this BMP: (?)

Comments:

Conservation Coordinator

Conservation Coordinator ◯ Yes ◯ No

Contact Information

First Name: BILL

Last Name: LYKINS

Title: STAFF SERVICES SPECIALIST

Phone: 805 378 3011

Email: bill.lykins@ventura.org

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
c. Support legislation or regulations that prohibit water waste
d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
e. Support local ordinances that prohibit water waste
f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description. (?)

File name(s): Email files to natalie@cuwcc.org Ventura County Waterworks Districts # 1,16,17,19, Water Conservation Rules and Regulations

Web address(s) URL: comma-separated list http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/WaterSanitation/Ventura%20Count

Enter a description: Ventura County Waterworks District Rules and Regulations, Part 1 - Section L Permanent Water Conservation Measures:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

2010 BMP 1.2 Water Loss Control

View MOU

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software ⦿ Yes ○ No

Email to natalie@cuwcc.org - Worksheets (AWWA Water Audit). Enter the name of the file below:

AWWA Water Audit-2010 (WWD#1)

Water Audit Validity Score from AWWA spreadsheet: 65

Agency Completed Training In The AWWA Water Audit Method ⦿ Yes ○ No

Agency Completed Training In The Component Analysis Process ○ Yes ⦿ No

Completed/Updated the Component Analysis (at least every 4 years)? ○ Yes ⦿ No

Component Analysis Completed/Updated Date: N/A

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective ⦿ Yes ○ No

Recording Keeping Requirements:

Date/Time Leak Reported	Leak Location
Type of Leaking Pipe Segment or Fitting	Leak Running Time From Report to Repair
Leak Volume Estimate	Cost of Repair

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective ⦿ Yes ○ No

Type of Program Activities Used to Detect Unreported Leaks

Water Sales vs Water Production

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

version 1.0

2009

Total Leaks Repaired	Economic Value Of Real Loss	Economic Value Of Apparent Loss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Interventions	Water Saved (AF/Year)
20				✓		

Comments: The only catagory tracked is Total Leaks Repaired

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

BMP 1.3 Metering with Commodity 2010

Link to FAQs

See the complete MOU: View MOU

See the coverage requirements for this BMP: ?

Implementation

Does your agency have any unmetered service connections? ○ Yes ○ No

If YES, has your agency completed a meter retrofit plan? ○ Yes ○ No

Enter the number of previously unmetered accounts fitted with meters during reporting year: 0

Are all new service connections being metered? ○ Yes ○ No

Are all new service connections being billed volumetrically? ○ Yes ○ No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? ○ Yes ○ No

Please Fill Out The Following Matrix

Account Type ?	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume ?	Billing Frequency Per Year	# of estimated bills/yr
Single-Family	9670	9670	9670	Bi-monthly	6
Commericial	315	315	315	Bi-monthly	6
Industrial	69	69	69	Bi-monthly	6
Agricultural	173	173	173	Bi-monthly	6
Instiitional	66	66	66	Bi-monthly	6
Other	14	14	14.3	Bi-monthly	6
Other				Other	
Other				Other	
Other				Other	
Other				Other	

Number of CII Accounts with Mixed-use Meters 282

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? ○ Yes ○ No

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

File name(s): Email files to natalie@cuwcc.org Enter the file name here e.g. WaterWastePreventionOrdinance

Web address(s) URL: comma-separated list Enter the URL to your documentation.

Comments:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

2010

BMP 1.4 Retail Conservation Pricing

Link to FAQs

View MOU

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to natalie@cuwcc.org.

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Allocation Based		8044104.35	
Allocation Based		752044.74	
Allocation Based		215337.98	
Allocation Based		767505.44	
Allocation Based		1993829.06	
Select a Rate Struc			1541509.74
Select a Rate Struc			

Implementation Option (Conservation Pricing Option)

- Use Annual Revenue As Reported
- Use Canadian Water & Wastewater Association Rate Design Model

If CWWA is select, enter the file name and email the spreadsheet to natalie@cuwcc.org

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service Yes No

Select the Retail Waste Water(Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform		0	2784960
Uniform		0	459072
Uniform		0	124416
Uniform		0	218592
Select a Rate Struc			
Select a Rate Struc			
Select a Rate Struc			

Comments:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

CUWCC

Link to FAQs

2010

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Is a Wholesale Agency Performing Public Outreach?

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited)

Metropolitan Water District, Calleguas Municipal Water District

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Public Contacts	Public Information Programs
12	Newsletter articles on conservation
12	Newsletter articles on conservation
6	General water conservation information
24	Website
	Select a public contact

Contact with the Media

Are there one or more wholesale agencies performing media outreach which can be counted to help your agency comply with the BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited)

Metropolitan Water District, Calleguas Municipal Water District

OR Retail Agency (Contacts with the Media)

Did at least one contact take place during each quarter of the reporting year? ✓

Media Contacts List

Number of Media Contacts	Did at least one contact take place during each quarter of the reporting year? / Media Contact Types
1	News releases
12	Radio contacts
12	Television contacts
	Select a type of media contact
	Select a type of media contact
	Select a type of media contact

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ○Yes ○No

Enter the name(s) of the wholesale agency (comma delimited)

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/WaterSanitation/water_conservation

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Additional web site: www.venturawatersavingsplants.com - Rebate Program Updates/Seasonal Sprinkler Adjustment Info. Permanent Water Conservation Rules and Rgulations Updates/Notifications of Waterwise Gardener classes/Rate/Allocation changes/Watering times changes.

Did at least one Website Update take place during each quarter of the reporting year? ○Yes ○No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	
Conservation	20000		☐		
			☐		
			☐		
			☐		
			☐		
			☐		

Comments:

Monthly water use reports with comparison of water use previous year's billing to current, customer notification if water use unusually high.. Some examples: Bi

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

CUWCC

Link to FAQs

2010

BMP 2.1 Public Outreach Cont'd

View MOU

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?
Workshop	3708	If yes, check the check box.
Website	4188	
Local Fair	125	

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ○ Yes ○ No

Public Outreach Additional Information

Public Information Programs	Importance

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ○ Yes ○ No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ○ Yes ○ No

Market Research Topic	
Brand Message	
Brand Mission Statement	

Community Committees

Do you have a community conservation committee? ○ Yes ○ No

Enter the names of the community committees: Did meet with the City of Moorpark to discuss AB 1881

Training

Training Type	# of Trainings	# of Attendees	Description of Other

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description

Partnering Programs - Partners

Name	Type of Program
☐ CLCA?	
☐ Green Building Programs?	
☐ Master Gardeners?	
☐ Cooperative Extension?	
☐ Local Colleges?	
☑ Other	Local Cities througout Ventura County participated in a water wise gardening web site

☐ Retail and wholesale outlet; name(s) and type(s) of programs:

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Members of our local water user's efficiency group meet quarterly to discuss local water issues and try to find county-wide projects that we could partner on.
We reviewed a partnership with Master Gardeners didn't fulfil our needs. SEE COMMENTS

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new

Customer Service entrance and gardens at facilities are planted with drought resistant and California native plants.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

N/A

Comments:

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

CUWCC

Link to FAQs

2010

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Is a wholesale agency implementing school programs which can be counted to help your agency comply with this BMP? ○ Yes ○ No

Enter Wholesaler Names, separated by commas: Metropolitan Water District

☑ Materials meet state education framework requirements?

Description of Materials: Curriculum Materials include teacher study guide and student workbooks.

☑ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students: Water wisdom - curriculum for grades 4-8, Teachers guide for hands on water activities, literature, conserving water at home guide for parents grades K-5, Know what we use - Water Wisely, conservation rulers,

Number of students reached: 6780

☑ Materials distributed to 7-12 Students?

Description of materials distributed to 7-12 Students:

Number of Distribution:

Annual budget for school education program: 10000

Description of all other water supplier education programs: Distribution of education conservation materials through local fair, traveling student poster Art Exhibit, Annual Poster Competition.

School Program Activities

Classroom presentations:

Number of presentations: 3 | Number of attendees:

Large group assemblies:

Number of presentations: 1 | Number of attendees: 350

Children's water festivals or other events:

Number of presentations: 0 | Number of attendees:

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations: 0 | Number of attendees:

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description

Number distributed

Staffing children's booths at events & festivals:

Number of booths 1 | Number of attendees 4,000

Water conservation contests such as poster and photo:

Description: Annual Poster Competition

Number distributed 6780

Offer monetary awards/funding or scholarships to students:

Number Offered 0 | Total Funding

Teacher training workshops:

Number of presentations 0 | Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips 0 | Number of participants

College internships in water conservation offered:

Number of internships 0 | Total funding

Career fairs/workshops:

Number of presentations 0 | Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events (if applicable) 0 | Number of participants

Total reporting period budget expenditures for school education programs (include all agency costs): 1,389.00

Comments

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS DISTRICT

Reporting unit name (District name): VENTURA COUNTY WATERWORKS DISTRICT

Reporting unit number: 233

Primary contact:

First name: BILL

Last name: LYKINS

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

View MOU

2010

BMP 3 Residential

○ **Traditional (Sections A - D)** ○ **Flex Track (All Sections)**

For Traditional Track please answer the fields within the traditional boxes.
For Flex Track option, please answer the fileds within the flex track boxes.
You must enter all measured water savings manually. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in form which are necessary to show that the measure was implemented as described.

A) Residential Assistance / Leak Detection

Flex Track

Traditional

	Single Family	Multi Family	Total Water Savings AF/YR	Measured Water Savings AF/YR
Total Number of Accounts	9670	0		
Total Number of Participants Overall	9670	0		
Total Number of Leak Det Surveys	0	00		
Total Number of Showerheads	300	0		
Total Number of Faucet Aerators	0	0		
Total Number of Landscape Water Survey	0	0		

Number of Other Components: 0

Description of Other Components Distributed: N/A

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

B) High Efficiency Clothes Washers (HECWs)

Flex Track

Traditional

Number of incentives for HECWs with an AVERAGE Water Factor of 5.0: 128

Are Financial incentives provided for HECWs ? ○ Yes ○ No

Has your Agency completed a HECW Market Penetration Study
(this question does not impack your coverage report, purely informational) ○ Yes ○ No

HECW Market Penetration Study Documents (Enter the file name and Email file to Natalie@cuwcc.org)

Measured water savings (AF/Year)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

C) WaterSense Specification (WSS) Toilets

(Agency must complete information for at least one coverage option (For Traditional 1, 2, or 3; For Flex Tarck 1, 2, 3, or 4). You are encouraged to include information on other coverage options, as available. If seeking credit for additional water savings, you must select Flex Track option)

Traditional

1. Retrofiton Resale Ordinanceis in Place O Yes O No

If Yes, Choose A File (Enter the file name and Email file to Natalie@cuwcc.org)

2. A 75% Market Saturation Achieved O Yes O No

If yes, Choose A File (Enter the file name and Email file to Natalie@cuwcc.org)

3. WSS Toilets Installed

	Single Family	Multi Family
Number of WSS Toilets Installed	38	0
Measured Water Savings AF/YR		

Flex Track

4. Non-WSS Toilets

	Single Family		Multi Family	
Type of Toilets	Number of Toilets	Water Savings	Number of Toilets	Water Savings
4				

Description of Other Non-WSS Type of Toilets

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

D) WSS for New Residential Development

(Agency must complete information for at least one coverage option.You are encouraged to include information on other coverageoptions, as available. If seeking credit for additional water savings you must select the Flex Track option)

Traditional

	Single Family		Multi Family	
Residential development Rebates	Yes	No	Yes	No
Recognition Programs	Yes	No	Yes	No
Reduced connection Fees	Yes	No	Yes	No
Ordinances	Yes	No	Yes	No

New Development Ordinance
(Enter the file name and Email file to Natalie@cuwcc.org)

Number of new Single Family Units built in Service Area: 37

Number of new Multi Family Units built in Service Area: 0

Flex Track

In the following table, enter one row for each incentive typr program you offer

List of Incentive Amount

Incentive Type	Incentive Amount	Number of WSS fixtures installed	Number of Participating Single Family	Number of Participating Multi Family	Measured Water Savings Single Family	Measured Water Savings Multi Family
HECW	120	128	127	00	3.9936	
HET	70	38	23	0	1.479	
Rotate Nozzle	8.00	162	3	0	0.71	
Synthetic Turf	.25	3962	4	0	0.55	
(Square Feet)						
WBIC	105	1	1	0	1.3	

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the le name and Email to Natalie@cuwcc.org

For Traditional Option, Stop Here, do not go further.
For Flex Track Option, please continue...

Flex Track Menu Options

In addition to the measures on the BMP List, the Flex Track menu options may be implemented to meet the savings goal for this BMP. Fill in the water savings measures that your agency has implemented.

E) High bill contact with single-family and multi-family customers

Measured water savings (AF/Year)

Select the Types of Contact:

☐ Email ☐ Phone ☐ Letter ☐ Others (describe)

Upload sample of contact contents (email, letter, etc.)
– if applicable; enter the file name and email file to Natalie@cuwcc.org

Who initiated the contact: (Please Specify customer, agencies, or both)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to Natalie@cuwcc.org)

F) Educate residential customers about the behavioral aspects of water conservation

Measured water savings (AF/Year)

Select types of educational methods used:	**# Events**	**# Customers Reached**
☐ Workshop		
☐ Community Event		
☐ Letter		
☐ On-Site Visit		
☐ Phone Call		
☐ Water Survey		
☐ Website Hit		
☐ Door Hanger		
☐ Other (Describe)		

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

G) Notify residential customers of leaks on the customer's side of the meter

Measured water savings (AF/Year)

Type of Notification (Describe)

How many were sent out?

Upload sample notification method(email, letter, etc.) – if applicable

(Enter the le name and Email le to Natalie@cuwcc.org

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the le name and Email le to Natalie@cuwcc.org)

H) Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.

Measured water savings (AF/Year)

0

Number of Leaks Repaired

Number of bill adjustments/credits/refunds provided

Describe here or upload a document with a policy description below:

Upload file describing Policy (Enter the file name and Email file to Natalie@cuwcc.org)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

I) Provide unique water savings fixtures that are not included in the BMP list above

Fixture or Device	Description	Quantity Installes	Measured water savings (AF/YR)
None			

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

J) Install residence water use monitors.

Type of Monitor	Brand	Number Installed
☐ Dashboard		
☐ Leak Detector		
☐ Data Logger		

Measured water savings (AF/Year)

0

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

K) Participate in programs that provide residences with school water conservation kits.

Number of Kits Distributed

Kit contents (including model of fixtures)

List of what was actually installed in the homes (number of showerheads, aerators etc.).

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

L) Implement an automatic meter reading program for residential customers.

AMR or AMI: Select an Option

Type of Network: Select an Option

Number of connections installed

☐ Is your agency using these to contact high water-use customers?

Measured water savings (AF/Year)

0

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

OTHER Types of Measures.

Type of Program	Sample / Description	Measured Water Savings (AF/YR)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

Comments

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

2010

Link to FAQs

View MOU

BMP 4 CII

Traditional ○ (Section A - L)

Flex Track ○ (All Sections)

For Traditional Track please answer the fields within the traditional boxes.

For Flex Track option, please answer the fileds within the flex track boxes.

You must enter all measured water savings manually in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings was measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

CII Type of measure implemented

Traditional

A) High - Efficiency Toilets.

Measured water savings (AF/Year)

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.041748 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

B) High - Efficiency Urinals (0.5 gpf)

Flex Track

Traditional

Number	0
Type of program	0
Other type of program	Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.069086 AF per device

If not, Please provide the following

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

C) Ultra Low Volume Urinals (0.125 gpf)

Flex Track

Traditional

Number	0
Type of program	Secect an Option
Other type of program	Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.080603 AF per device

If not, Please provide the following

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

D) Zero Consumption Urinals (0.0 gpf)

Flex Track

Traditional

Number	0
Type of program	Select an Option
Other type of program	Do not have a CII rebate Program at this time..

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes ○ No

Flex Track

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

Council's Annual Water Savings 0.0921146 AF per device

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

E) Commercial High - Efficiency Single Load Clothes Washers

Traditional

Number: 0

Type of program: 0

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Counsil's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.116618 AF per device

If not , Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

F) Cooling Tower Conductivity Controllers.

Traditional

Number: 0

Type of program: Other

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 1.032250 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

G) Cooling Tower pH Controllers

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 3.981543 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

H) Connectionless Food Steamers.

Traditional

Number: 0

Type of program: 0

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.25 AF per Steamer Compartment

mIf not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

I) Medical Equipment Steam Sterilizers

Flax Track

Traditional

Number: 0

Type of program: 0

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 1.538 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

J) Water - Efficient Ice Machines.

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time..

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.0834507 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Enter the file name and Email to Natalie@cuwcc.org

K) Pressurized Water Brooms.

Traditional

Number: 0

Type of program: Select an Option

Other type of program: Do not have a CII rebate Program at this time.

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.1534 AF per device

Flex Track

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

L) Dry Vacuum Pumps.

Traditional

Number	0
Type of program	3
Other type of program	Do not have a CII rebate Program at this time..

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.064 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Traditional Reporting Stop Here, Do not continue

Flex Track Reporing Please Continue...

M) Industrial Process Water Use Reduction.

Measured water savings (AF/Year)

Number	
Type of program	Select an Option
Other type of program	
Type of Process Water Reduced	
If re-using water, what was the secondary use of the water? (such as pre-rince cycle or landscaping)	

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

N) Commercial Laundry Retrofits.

Number of customers

Measured water savings (AF/Year)

Type of customer

☐ hotels
☐ campuses
☐ prisons
☐ laundromats

Lease / own machines

○ Lease ○ Own Machines ○ Both

Type of program

Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

O) Industrial Laundry Retrofits.

Measured water savings (AF/Year)

Total Number of customers

Total Volume of laundry processed annually

Select an Option

Type of program

Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

P) Filter Upgrades (for pools, spas, and fountains).

Number of pools upgraded

Number of spas upgraded

Number of fountains upgraded

Type of program

Select an Option

Other type of program

Measured water savings (AF/Year)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Q) Car Wash Reclamation Systems

Measured water savings (AF/Year)

	Conveyor	In-bay
Total Number of program participants (accounts)		
Total Number of vehicles washed annually		

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.00004607 (or 15 gals) per vehicle

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

R) Wet Cleaning.

Brief description of program

Measured water savings (AF/Year)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

S) Water Audits (To avoid double counting, do not include device/replacement water savings.)

Number of water audits by type of business

Measured water savings (AF/Year)

Auto

Food

Health

Hotels

Manufacturing

Membership

Multi-use

Office

Religious

Restaurant

Retail/ Wholesale

School

Other (with description)

Description of Other

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet Enter the le name and Email to Natalie@cuwcc.org

T) Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

Measured water savings (AF/Year)

Number of customers

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

U) Waterless Wok

Number

Type of program: Select an Option

Measured water savings (AF/Year)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

V) Alternative On-site Water Sources

(For Rain Water Harvesting, commercial rain barrels are excluded. For Foundation Drain Water, exclude permeable paving.)

Measured water savings (AF/Year)

Select type	Number	Description
☐ Cooling Condensate		
☐ Foundation Drain Water		
☐ Gray Water		
☐ Storm Water		
☐ Rain Water		
☐ Pond and Water Feature Recycling		

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

W) Sub - metering

Measured water savings (AF/Year)

Select type Number Description

☐ Condominiums

☐Apartments

☐Mobile Homes

Do you accept the Council's default savings numbers for this measure? ○Yes○No

Council's Annual Water Savings
Appartments & Condos=0.024419 AF/YR
Mobile Home = 0.056774 AF/Yr

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

X) High Efficiency Showerheads

Measured water savings (AF/Year)

Number

Type of program Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Y) Faucet Flow Restrictors

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

Z) Water Efficient Dishwashers

Measured water savings (AF/Year)

Select type — Number

☐ Rack

☐ Conveyor

☐ Other

Description of Other

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

AA) Hot Water on Demand

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to Natalie@cuwcc.org

BB) Pre-rinse Spray Valves of 1.3 gpm (gallons per minute) or less

Measured water savings (AF/Year)

Number

Type of program: Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

CC) Central Flush Systems

Measured water savings (AF/Year)

Number

Type of program

Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

Other Measures chosen by the Agency

Measured water savings (AF/Year)

Description of program

Sample (if applicable)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the le name and Email to Natalie@cuwcc.org

The fields in red are required.

Agency name: VENTURA COUNTY WATERWORKS

Reporting unit name (District name): VENTURA COUNTY WATERWORKS

Reporting unit number: 233

Primary contact:

First name: Bill

Last name: Lykins

Email: bill.lykins@ventura.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

Link to FAQs

View MOU

2010

BMP 5 Landscape

○ **Traditional** ○ **Flex Track**

For Traditional Track please answer the fields within the traditional boxes.
For Flex Track option, please answer the fileds within the flex track boxes.
You must enter all measured water savings manually. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data point salso requested in form which are necessary to show that the measure was implemented as described.

Accounts with Dedicated Irrigation Meters

Flex Track

Traditional

Number of dedicated irrigation meter accounts	464
Number of dedicated irrigation meter accounts with water budgets	372
Aggregate water use for dedicated non-recreational landscape accounts with budgets	4549.1
Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	7024.97
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	○ Yes ○ No

Water Savings from Accounts with dedicated irrigation meters with water budgets (Acre Feet)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to Natalie@cuwcc.org)

Technical Assistance

Flex Track

Traditional

Number of Accounts 20% over-budget	30
Number of accounts 20% over-budget offered technical assistance	30
Number of accounts 20% over-budget accepting technical assistance	3

Measured water savings (AF/Year)

Not Available

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to Natalie@cuwcc.org)

Irrigation Water Use Surveys for Mixed-use and Un-metered Accounts

Flex Track

Traditional

Number of mixed use and un-metered accounts	9783
Number of irrigation water use surveys offered (cumulative, all years)	1000
Number of irrigation water use surveys accepted (cumulative)	50
Can your Agency estimate the amount of landscape acreage for mixed use and Un-metered accounts	O Yes O No
If Yes, Aggregate acreage for mixed use and Un-metered accounts	

Measured water savings (AF/Year)

Esrimated water demand from acreage for mixed use and Un-metered accounts	
Annual water savings by customers receiving irrigation water savings surveys and implementing recomendations	

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

Financial Incentives

Flex Track

Traditional

Have you implemented and maintained an irrigation equipment retrofit incentive program? O Yes O No

Number of incentives	Dollar value of incentives	Incentive Types	Measured Water Savings (AF/YR)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

Traditional Reporting Stop Here, Do not continue
Flex Track Reporing Please Continue...

Landscape Flex Track Measure Types

1. Monitor and report on landscape water use

A) Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules (such as faxes, twitter, etc. not included in the previous sections).

Measured water savin (AF/Year) [ ]

Enter the Number of sites with:

Dedicated Mixed Meters [ ]

Water Budgets [ ]

Landscape Measurements [ ]

Others (describe) [ ] [ ]

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

[ ]

B) Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Measured water savings (AF/Year) [ ]

Enter the Number of sites with:

Dedicated Mixed Meters [ ]

Water Budgets [ ]

Landscape Measurements [ ]

Others (describe) [ ] [ ]

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

[ ]

C) Establish agency-wide water budget. (Note that: ETo based water budget in the MWELO changed in 2010 from .8ETo to .7ETo.)

Measured water savings (AF/Year) [ ]

Agency-wide total irrigated area Per-2010 [ ] (Acres)

Agency-wide totak irrigated area Post-2010 [ ] (Acres)

Amount of Water Used [ ] (AF/Acre)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

D) Establish agency-wide, sector-based irrigation goal to reduce water use, based on seasonality.

Measured water savings (AF/Year)

Number of minimum irrigation goal (AF/Acre)

Amount of Water Used per Period (AF/Period)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

2. Provide technical landscape resources and training

A) Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

Measured water savings (AF/Year)

Enter the Number of:

Contacts In Person

Contacts over the phone

Contacts via Email

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

Enter the Number of:

Measured water savings (AF/Year)

Audits conducted per year

Measurement of square footage of Turf areas

Measurement of square footage of NON Turf areas

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

C) Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

Enter the Number of:

Events

Participants

List Type or Title of Events

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

D) Establish Time-of-Day Irrigation Restrictions.

Yes No

Describe Restrictions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

E) Establish Day-of-Week Irrigation Restrictions. Yes No

Describe Restrictions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to Natalie@cuwcc.org)

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3. Provide incentives

A) Establish Landscape budget-based rates. ○ Yes ○ No

Describe Rates:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

Measured water savings (AF/Year)

Number of Conversions:

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

C) Provide incentives for installing sub-meters to separate landscape water use

Measured water savings (AF/Year)

Number of meters installed:

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

D) Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

Select types of irrigation equipment upgrades:

Number of devices installed

Measured water savings (AF/Year)

- ☐ Controllers
- ☐ Emitters
- ☐ Soil moisture sensors
- ☐ Pressure Regulators
- ☐ Rain shut off devices
- ☐ Other (describe)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

E) **Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.**

Acreage of live turf converted to low water-using plants, artificial turf, or permeable surfaces: Acres

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

F) **Provide incentives for conversions from potable to recycled water.**

Number of Conversions:

Number of Incentives:

Funds Invested:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

G) **Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)**

Number of Conversions:

Number of Incentives:

Funds Invested:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

4. Participate in local and regional planning and regulatory activities

A) Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

Measured water savings (AF/Year)

Public Information Programs List

Agency Type	Describe Involvement	If Ohter: Enter Name	Actions

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

B) Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

○ **Yes** ○ **No**

Describe Involvement:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

C) Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

○ Yes ○ No

Measured water savings (AF/Year)

Describe Involvement:

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

5. Develop a holistic approach to landscape water use efficiency

A) Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

Describe Program:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to Natalie@cuwcc.org)

6. Other Measures

A) Other Landscape Measures.

Measured water savings (Af/Year)

Describe Other Landscape Measures:

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file Natalie@cuwcc.org)

Appendix G

Ventura County Waterworks District No. 1 Rules and Regulations for Water Service, Section K – Water Shortages; Section L – Permanent Water Conservation Measures

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PART 1 - SECTION K - WATER SHORTAGES [176]

RULE

1-K-1 **EMERGENCY RESTRICTIONS ON WATER USE:** [176]

1-K-1a **EMERGENCY RESTRICTIONS ON WATER USE DUE TO SYSTEM EMERGENCIES:** [176] If the Director determines that over-consumption of water, loss of pressure in a system, breakdown, or any similar occurrence, requires emergency restrictions upon the use of water from any system, the Director shall order such restrictions as the Director in his or her sole discretion, deems appropriate under the circumstances.

Such order may restrict the use of water for sprinkling, manufacturing, or nonessential uses. The use of water for particular purposes may be limited to specified days or hours of a day or altogether prohibited, except that the use of water for drinking, cooking, and sanitary purposes shall not be prohibited.

Notice of any such order shall be given, either in writing or orally when possible, to customers served by the affected system. Water supply to any premises upon which the use of water is being made in violation of such order may be summarily shut off.

When the Director determines that the emergency no longer exists, The Director shall, by further order, rescind the restrictions previously ordered under this section. Notice of such order shall be given to customers in the same manner in which the order imposing the restrictions was given.

1-K-1b **EMERGENCY RESTRICTIONS ON WATER USE DUE TO OTHER THAN SYSTEM EMERGENCIES:** [176] If the Engineer determines that circumstances other than those specified elsewhere in Section K (such as natural disaster, epidemic, accident, war, other violent activity, labor dispute, civil disturbance or state or federal statute or executive or judicial order) require emergency restrictions upon the use of water from any system, the Engineer shall order such restrictions as the Engineer in his or her sole discretion, deems appropriate under the circumstances, and then shall obtain ratification of the order from the Districts' Board at its first meeting following such restriction order.

Such order may restrict the use of water for sprinkling, manufacturing, or nonessential uses. The use of water for particular purposes may be limited to specified days or hours of a day or altogether prohibited, except that the use of water for drinking, cooking, and sanitary purposes shall not be prohibited.

Notice of any such order shall be given, either in writing or orally when possible, to customers served by the affected system. Water supply to any premises upon which the use of water is being made in violation of such order may be summarily shut off.

When the Engineer determines that the emergency no longer exists, The Engineer shall, by further order, rescind the restrictions previously ordered under this section. Notice of such order shall be given to customers in the same manner in which the order imposing the restrictions was given.

1-K-2 **LEVEL 1 WATER SUPPLY SHORTAGE**

1-K-2a A Level 1 Water Supply Shortage exists when the Engineer determines in his or her sole discretion that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists, and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the Engineer of a Level 1 Water Supply Shortage condition, the Director shall implement the mandatory Level 1 conservation measures identified in this section, effective on the date determined by the Director. 176

1-K-2b In addition to the prohibited uses of water identified in Part 1 - Section L – Permanent Water Conservation Measures, the following water conservation measures apply during a declared Level 1 Water Supply Shortage.

(i) Exterior Water Use: The District will implement Incremental Interruption Plan Level 2 allocations and water rates to achieve the desired reduction in exterior water use. 176

1-K-3 **LEVEL 2 WATER SUPPLY SHORTAGE** 176

1-K-3a A Level 2 Water Supply Shortage exists when the Engineer determines in his or her sole discretion that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists, and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the Engineer of a Level 2 Water Supply Shortage condition, the Director shall implement the mandatory Level 2 conservation measures identified in this section, effective on the date determined by the Director.

1-K-3b In addition to the prohibited uses of water identified in Part 1 – Section K – Rule 1-K-2, Level 1 Water Supply Shortage, and Part 1 – Section L – Permanent Water Conservation Restrictions, the following water conservation measures apply during a declared Level 2 Water Supply Shortage:

(i) Exterior Water Use: District will implement Incremental Interruption Plan Level 2 allocations and water rates to achieve the desired reduction in exterior water use.

(ii) Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the declaration of a supply shortage level under these Rules and Regulations.

(iii) Limits on Washing Vehicles: Using water to wash or clean a vehicle is prohibited, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

(iv) Limits on Filling Residential Swimming Pools and Spas: Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

1-K-4 **LEVEL 3 WATER SUPPLY SHORTAGE – EMERGENCY CONDITION** [176]

1-K-4a A Level 3 Water Supply Shortage condition is also referred to as an "Emergency" condition. A Level 3 condition exists when the Engineer determines that a significant reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety, declares a water shortage emergency and notifies District residents and businesses of the emergency. Upon the declaration by the Engineer of a Level 3 Water Supply Shortage condition, the Director shall implement the mandatory Level 3 emergency conservation measures identified in this section, effective on the date determined by the Director.

1-K-4b In addition to the prohibited uses of water identified in Part 1 – Section K – Rules 1-K-2, Level 1 Water Supply Shortage, and 1-K-3, Level 2 Water Supply Shortage, and Part 1 – Section L – Permanent Water Conservation Restrictions, the following water conservation measures apply during a declared Level 3 Water Supply Shortage Emergency:

(i) No Watering or Irrigating: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use, unless it is determined by the Director that recycled water is available and may be applied to the use:

a. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container or hand-held hose equipped with a positive self-closing water shutoff nozzle or device.

b. Maintenance of existing landscape necessary for fire protection.

c. Maintenance of existing landscape for soil erosion control.

d. Maintenance of plant materials identified to be rare or essential to the well-being of protected species.

e. Maintenance of landscape within active public parks and playing fields, day-care centers, golf course greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Rule 1-K-3b(i) and time restrictions in Rule 1-L-2h.

f. Actively irrigated environmental mitigation projects.

(ii) **Obligations to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty-four (24) hours of notification as set forth in Rule 1-L-2b unless other arrangements are made with the District.

(iii) **No New Potable Water Service:** Upon declaration of a Level 3 Water Supply Shortage Emergency, no new potable water service will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as will-serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

a. A valid, unexpired building permit has been issued for the project; or

b. The project is necessary to protect the public health, safety, and welfare; or

c. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less.

1-K-5 <u>NO NEW ANNEXATIONS</u>: Upon the declaration of a Level 3 Water Supply Shortage condition, the District will suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any increased use of water. [176]

1-K-6 <u>DISCONTINUED SERVICE</u>: The Director, in his or her sole discretion, may discontinue service to consumers who willfully violate the Level 3 Water Supply Shortage provisions. [176]

1-K-7 <u>PROCEDURES FOR DETERMINATION/NOTIFICATION OF WATER SUPPLY SHORTAGE</u> [176]

1-K-7a **DECLARATION AND NOTIFICATION OF WATER SUPPLY SHORTAGE**: The existence of a Level 1, Level 2 or Level 3 Water Supply Shortage condition shall be declared by the District Board or Engineer. If the declaration is made by the Engineer, the Engineer shall seek ratification of the declaration from the District Board at its first meeting following the declaration. Upon such declaration, all District customers shall be notified in writing of the applicable mandatory conservation measures, the date the measures are to take effect and, by reference to rule 1-L-4a of these Rules and Regulations, the penalties that may be imposed for failing to comply with the measures.[176]

1-K-8 **HARDSHIP WAIVER:** [176]

1-K-8a **UNDUE AND DISPROPORTIONATE HARDSHIP:** If, due to unique circumstances, a specific requirement of this section would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirements as provided in this section.

1-K-8b **WRITTEN FINDING:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to a property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

(i) Application: Application for a waiver shall be on a form prescribed by the District and shall be accompanied by a non-refundable processing fee in an amount set by the District.

(ii) Supporting Documentation: The application shall be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant

(iii) Required Findings for Waiver: An application for a waiver shall be denied unless the Approval Authority finds, based upon the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the District, all of the following:

a. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

b. That because of special circumstances applicable to the property or its use, the strict application of this section would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

c. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the District to effectuate the purpose of this section and will not be detrimental to the public interest; and

d. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

1-K-8c **APPROVAL AUTHORITY:** The Director shall have approval authority and act upon any completed application no later than twenty (20) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver shall be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the term of the mandatory water supply shortage condition. 176

1-K-8d **APPEALS TO THE DISTRICT:** An applicant may appeal a decision by the Director to deny or conditionally approve a waiver application by filing a written request for hearing with the Engineer within ten (10) days of Director's decision. The request for hearing shall state the grounds for the appeal. At a public hearing, the Engineer shall act as the Approval Authority and review the appeal in accordance with the standards established in this rule. The decision of the Engineer is final. 176

PART 1 - SECTION L – PERMANENT WATER CONSERVATION MEASURES

RULE

1-L-1 **WATER SAVING DEVICES**: All new customers shall install and use the following water efficient plumbing fixtures:

(i) Ultra low volume toilets (1.6 gallons per flush or less).

(ii) Low flow shower heads (2.0 gallons per minute or less).

1-L-2 **WATER WASTE PROHIBITED**: 177 No person shall use or permit the use of District water as follows:

1-L-2a Watering of turf, ornamental landscape, open ground crops and trees, in a manner or to an extent which allows water to run to waste. 177

1-L-2b In any manner such that the escape of water through leaks, breaks, or malfunctions within the water user's plumbing or distribution system occurs for any period of time beyond which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of forty-eight hours after the water user discovers such leak, break, or malfunction, or receives notice from the District of such condition, whichever occurs first, is a reasonable time within which to correct such condition. 64

1-L-2c Using water to wash or clean a vehicle, including but not limited to washing automobiles, trucks, trailers, boats, or other types of mobile equipment, without the use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility. 177

1-L-2d Operating any ornamental fountain, or similar structures, unless water for such is recycled for lawful reuse without substantial loss. 64

1-L-2e Washing down hard or paved surfaces, including but not limited to washing of sidewalks, walkways, driveways, parking lots or any other hard-surfaced areas by hose or flooding, except as otherwise necessary to prevent or eliminate conditions dangerous to the public health and safety or for other legitimate uses approved by the District, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, a low-volume high-press cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom. 177

1-L-2f Serving water in eating or drinking establishments, including but not limited to restaurants, hotels, cafés, bars or other public places where food or drinks are sold or served, to customers without first being expressly requested by the customer. 177

1-L-2g For any indiscriminate running of water or washing with water not otherwise prohibited above which is wasteful and without reasonable purpose. 64

1-L-2h Watering of residential, commercial, industrial, and governmental outdoor irrigation from 9:00 a.m. to 4:00 p.m. except for a short duration, not to exceed 3 minutes per station, for the limited purpose of testing or making repairs to the irrigation system. Agricultural customers are exempt from this irrigation schedule, but must comply with agricultural irrigation schedules determined by the District. 177

1-L-2i Running of water or spraying of water onto other properties. 177

1-L-2j Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended for more than ten (10) minutes watering per day per station. This rule does not apply during the establishment period, as determined by the District, for new landscaping. 177

1-L-2k For laundry purposes by hotels, motels and other commercial lodging establishments, except where customers are given the option of not having towels and linens laundered daily through the prominent display of written notice of such option in each bathroom using clear and easily understood language. 177

1-L-2l Through the installation of single pass cooling systems in buildings requesting new water service. 177

1-L-2m Through the installation of non re-circulating water systems in new commercial conveyor car wash and new commercial laundry systems. 177

1-L-2n Through the use of non-water conserving dish wash spray valves by food preparation establishments, such as restaurants and cafes. 177

1-L-2o Through a commercial conveyor car wash operating without a re-circulating water system, or without first securing a waiver of this requirement from the Director. 177

1-L-3 **IRRIGATION SCHEDULES**: District may impose irrigation schedules for outdoor use, including agricultural use, to address water conservation and limited water supply.

1-L-4 **FAILURE TO COMPLY**:

1-L-4a **CIVIL PENALTIES**: In addition to any other penalties or sanctions provided by law, the following civil penalties shall be imposed for violation of any of the provisions of these rules, to be paid by the customer at the premises at which the violation occurred: 177

(i) For the first violation of any of the provisions of these rules a written notice will be given to the customer.

(ii) For the second violation of any of the provisions of these rules within the preceding (12) twelve calendar months, a penalty of one hundred dollars ($100.00) shall be imposed by written notice to the customer. This penalty is payable as part of the water bill, by the customer at the premises at which the violation occurred.

(iii) For the third violation of any of the provisions of these rules within the preceding (12) twelve calendar months a penalty of two hundred and fifty dollars ($250.00) shall be imposed by written notice to the customer. This penalty is payable as part of the water bill, by the customer at the premises at which the violation occurred.

(iv) For the fourth violation of any of the provisions of these rules within the preceding twelve (12) calendar months, a penalty of five hundred dollars ($500.00) shall be imposed by written notice to the customer. This penalty is payable as part of the water bill, by the customer at the premises at which the violation occurred.

The District may also give written notice to the customer indicating that it will install a flow restricting device of 1 GPM capacity for services up to one and one half inch meter size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight (48) hours. The charge for installing such a flow restricting device will be based upon the size of the meter and the actual cost of installation. The charge for removal of the flow restricting device and restoration of normal service shall be based on the actual cost involved. Said charges shall be payable by the customer as part of the water bill. Restoration of normal service will be performed during the hours of 8:00 a.m. to 4:00 p.m. on regular working days. In addition, a surcharge penalty of $100.00 shall be imposed for restoration of normal service, payable by said customer as part of the water bill.

(v) If there are five violations of any of the provisions of these rules within twelve (12) consecutive calendar months, the District may, following notice to the customer as described herein, discontinue water service to the customer at the premises at which the violation occurred.

1-L-4b **NOTICE**: The District will give notice of each violation to the customer at the premises at which the violation occurred, as follows: 177

(i) For a first, second, or third violation, the District may give written notice of such violation to the customer personally or by regular mail.

(ii) If the penalty assessed is, or includes the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time whatever, notice of the violation will be given in the following manner:

a. By giving written notice thereof to the customer personally; or

b. If the customer is absent from or unavailable at the customer's billing address, place of residence, or place of business, by leaving a copy with an adult at such places, and by sending a copy through the United States mail addressed to the customer at such places, via registered mail return receipts requested.

c. If notice as provided in a and b above, is not successful, notice can be given by affixing a copy in a conspicuous place on the property where the failure to comply has occurred and also by delivering a copy to a person residing at the premises, if such person can be found.

d. All notices will contain, in addition to the facts of the violation, a statement of the possible penalties for each violation, a statement informing the customer of his or her right to a hearing on the violation, a brief summary of the appeal process specified herein, copies of Rules 1-L-4c and 1-L-4d, and the date and time installation of the restrictor or discontinuance of the service will occur.

1-L-4c **HEARING:** Any customer against whom a penalty is to be levied pursuant to this section shall have a right to a hearing, in the first instance by the Director, with the right of appeal to the Engineer or his or her designee, on the merits of the alleged violation, upon the written request of that customer to the Director within fifteen (15) days of the date of giving notice of the violation. Penalties, including termination of water service, will be stayed until any such hearing is conducted and a written decision is made by the Director or his or her designee and given to the customer. 177

1-L-4d **APPEAL OF DECISION OF DIRECTOR:** A request for an appeal must be in writing and filed with the Engineer or his or her designee. The filing by a customer of a request for an appeal for any form of relief must be made within fifteen (15) days of the giving of the decision of the Director to the customer. Filing of such a request will automatically stay the implementation of the proposed course of action, pending the decision of the Engineer or his or her designee. No other or further stay will be granted. The appeal hearing will be scheduled to occur within a reasonable, prompt period of time following the written notice of appeal. The customer may present any evidence that would tend to show that the alleged wasteful water use has not occurred. Formal rules of evidence will not apply and all relevant evidence customarily relied upon by reasonable persons in the conduct of serious business affairs will be admissible, unless a sound objection warrants its exclusion by the Engineer or his or her designee. The decision of the Engineer or his or her designee shall be final. $_{177}$

1-L-4e **RECONNECTION**: Where water service is disconnected, as authorized above, it will be reconnected upon correction of the condition or activity and the payment of the estimated reconnection charge.

1-L-4f **PUBLIC HEALTH AND SAFETY**: Nothing contained in these rules shall be construed to require the District to curtail the supply of water to any customer when, in the discretion of the Engineer or his or her designee, such water is required by that customer to maintain an adequate level of public health and safety. $_{177}$

Appendix H

Fox Canyon Groundwater Management Agency Groundwater Management Plan, May 2007 and Applicable Ordinances

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2007 Update to the Fox Canyon Groundwater Management Agency Groundwater Management Plan

Prepared by

Fox Canyon Groundwater Management Agency
United Water Conservation District
Calleguas Municipal Water District

May 2007

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The Fox Canyon Groundwater Management Agency (FCGMA) was initially created to manage the groundwater in both overdrafted and potentially seawater-intruded areas within Ventura County. The prime objectives and purposes of the FCGMA are to preserve groundwater resources for agricultural, municipal, and industrial uses in the best interests of the public and for the common benefit of all water users. Protection of water quality and quantity along with maintenance of long-term water supply are included in those goals and objectives.

Initial goals of the FCGMA included balancing water supply and demand in the Upper Aquifer System (UAS) by the year 2000 and in the Lower Aquifer System (LAS) by year 2010. These goals and the FCGMA's basic purpose remain relatively unchanged today. The initial Groundwater Management Plan for the FCGMA was prepared in 1985. This current document is an update to that initial Plan. Since preparation of the initial Plan, significantly more is now known about the occurrence of the seawater intrusion and basin overdraft through focused monitoring programs, studies, and modeling. There has also been a period of time to observe how FCGMA policies and water conservation facilities have improved groundwater conditions.

The goals of this Management Plan are to set specific, measurable management objectives for each basin, identify strategies to reach these goals, and set future FCGMA policy to help implement these strategies. The FCGMA cannot itself build and operate conservation facilities, so the focus of this Plan is both on potential FCGMA policies and on strategies and policies that can assist in implementing conservation projects by other agencies. Thus, the FCGMA acts as a partner with the other agencies in improving conditions in the aquifers within the Agency.

The main focus of the initial Groundwater Management Plan was to contain seawater intrusion in the south Oxnard Plain basin. The combination of FCGMA policies and new water conservation facilities, which included the FCGMA pumping reductions, shifting of pumping from the Upper Aquifer System to the Lower Aquifer System, the construction of the Freeman Diversion, and the operation of the Pumping Trough and Pleasant Valley pipeline systems, has had a significant effect on seawater intrusion in at least a portion of the aquifers. The most significant effect was the reduction of the lobe of seawater in the Upper Aquifer System at Port Hueneme. Monitoring wells drilled into this lobe indicate that seawater intrusion has retreated and is no longer detectable in some areas near Port Hueneme, with groundwater in one well improving from near-seawater back to drinking-quality water.

However, the containment of saline waters is not complete. In the Pleasant Valley and south Oxnard Plain basins, saline waters both from the ocean and from adjacent fine-grained sediments have expanded the area of saline intrusion since 1985. This increase occurred in the Upper Aquifer System near Point Mugu and the Lower Aquifer System in the Port Hueneme and Point Mugu areas. Thus, continuation of current strategies and the implementation of additional strategies are required to fully contain saline intrusion.

Additional water quality problems have also been identified since the original FCGMA Plan was adopted. These include increasing chlorides and other salts in the South Las Posas basin and locally in the Pleasant Valley basin, as well as increased nitrates in the Forebay basin during periods of reduced rainfall and groundwater recharge.

This 2007 Update to the FCGMA Groundwater Management Plan discusses and reviews a number of aspects of groundwater management:

- background information on the groundwater basins;
- history of groundwater extractions within the FCGMA;
- water quality issues, both generally and basin-by-basin,
- basin management objectives to indicate the health of the basin and the efficacy of current and future management strategies;
- the yield of the groundwater basins;
- current management strategies and their effectiveness;
- management strategies under development and their potential effectiveness;
- potential future management strategies and their potential effectiveness; and
- recommended actions to be taken by the FCGMA.

In addition, three appendices include:

- progression of saline intrusion in the Upper and Lower Aquifers;
- description of the Ventura Regional Groundwater Model that was used to evaluate management strategies, as well as details of those evaluations; and
- East Las Posas Basin Management Plan, which deals with issues specific to that basin and that will be adopted as part of this Groundwater Management Plan.

Basin Management Objectives (BMOs) are defined for the basins within the FCGMA in this Plan. The BMOs are measurable groundwater elevation and water quality goals that, if reached, protect the aquifers from further saline intrusion and other water quality problems. The BMOs are set at particular key wells in the groundwater basins. Current groundwater conditions meet the BMO criteria in some, but not all of the basins. They fail to meet BMOs in the Lower Aquifer and portions of the Upper Aquifer in the Oxnard Plain and Pleasant Valley basins, periodically in the Forebay basin, and locally in the Las Posas and Santa Rosa basins. Using the Ventura Regional Groundwater Model to evaluate the effectiveness of management strategies into the future, current management strategies are predicted to meet BMOs for groundwater elevations 51% of the time in the Upper Aquifer and only 5% of the time in the Lower Aquifer[*].

The annual yield of the basins within the FCGMA was calculated to be about 120,000 acre-feet (AF) for the 1985 Groundwater Management Plan. Current pumping within the FCGMA has decreased to something close to that number, however, and BMOs are not being met in key areas – which is consistent with the groundwater model results discussed in the previous paragraph. To recalculate the yield of the basin, groundwater pumping was progressively reduced in the model until BMOs were met on average 50% or more of the time. Pumping would have to be reduced to 100,000 acre-feet per year (AFY) to meet the BMOs, providing that these additional reductions were accomplished largely in the south Oxnard Plain and Pleasant Valley basins.

Because current management strategies are not sufficient to meet BMOs and pumping needs to be reduced to 100,000 AFY, additional management strategies need to be implemented. A series of these additional strategies are proposed in this Plan. Some of these strategies are currently being developed, whereas others would be implemented in the future. For strategies

[*] Percentage is based on the average number of quarters when BMOs are met at each BMO well during the 55-year modeling period of the Ventura Regional Groundwater Model. For an initial target, it is proposed that groundwater elevation BMOs be met at least 50% of the time, thus taking into account that climatic cycles will cause groundwater elevations to rise and fall periodically above and below these objectives.

that were amenable to being evaluated using the Ventura Regional Groundwater Model, the effectiveness in meeting BMOs was calculated.

The following table summarizes the proposed strategies; the strategies are grouped initially by when they could be implemented and secondarily within each time increment by their potential effectiveness in managing the basins and meeting BMOs.

Strategies Currently Under Development

- GREAT Project (recycled water for in-lieu delivery and direct injection)
- South Las Posas Pump/Treat (pump poor quality water and blend/treat it)
- Development Brackish Groundwater, Pleasant Valley (similar to previous, pumping from northern Pleasant Valley basin)
- Non-Export FCGMA Water (water pumped within FCGMA and applied in adjacent areas outside the Agency)
- Continuation of 25% Pump Reduction (continue original Plan strategy of 25% reductions by 2010)
- RiverPark Recharge (additional Santa Clara River recharge)

5-Year Strategies

- 5-Year Update of Plan
- Shift Pumping to UAS (prepare technical basis and policy)
- Protect Recharge (protect current sources of recharge)
- Limit Nitrates in the Forebay (land use, Best Management Practices)
- Recovery of Credits from the Forebay (uniform policy)
- Verification of Extraction Reporting (verify accuracy of reporting)
- Separate Strategies for Each Basin (as needed)
- FCGMA Boundary (adjust slightly to reflect new hydrogeologic understanding)
- Irrigation Efficiency (determine if warrants modifications)
- Additional Storage Projects (to help fill overdrafted basins)
- Penalties Used to Purchase Replacement Water (refill overpumped areas)
- Additional Water Conservation (encourage local agencies)
- Shelf Life for Conservation Credits (limit the long-term accumulation of credits and/or limit number of credits pumped in any one year)

10-Year Strategies

- Additional In-lieu Deliveries to South Oxnard Plain
- Import Additional State Water (for direct or in-lieu recharge)
- Further Destruction of Abandoned or Leaking Wells
- Additional Monitoring Needs (as needed to track saline intrusion or other groundwater issues)

15-Year Strategies

- Barrier Wells in South Oxnard Plain
- Injection of Treated River Water into Overdrafted Basins
- Increase Diversions from Santa Clara River (additional water rights from peak storm flows)
- Shift Pumping to Northwest Oxnard Plain

Greater Than 15-Year Strategies

- Additional Reductions in Pumping Allocations (if strategies are not fully implemented or if they fail to meet BMO targets)

The Ventura Regional Groundwater Model was used to evaluate the effect of individual strategies, as well as the combination of strategies. If all the strategies are implemented as recommended (especially those ranked highest in each time horizon), the model predicts that BMOs for the Upper Aquifer will be met 67% of the time and BMOs for the Lower Aquifer will be met 76% of the time – a major improvement that would likely halt further degradation of groundwater quality.

This management plan calls for a set of actions to implement the recommended strategies. Some of these strategies can be implemented directly by the FCGMA through policy additions or modifications. Other strategies, especially those requiring infrastructure to be built, will be largely the responsibility of other organizations. To ensure that all the strategies are implemented as seamlessly as possible, it is recommended that there be a joint Strategic Planning and Implementation effort with the other agencies that will help implement the strategies in this Plan.

The importance of implementing the strategies in this Plan is illustrated by three potential choices that are available to the FCGMA, organizations, and groundwater pumpers:

- Implementation of recommended strategies in this Plan –resulting in major improvement in overdraft conditions and the potential halt in further degradation of groundwater quality; or
- Most effective strategies not implemented because of cost, lack of cooperation, lack of will – resulting in further FCGMA reductions in pumping allocations. Reductions of an additional 85% of pumping in the south Oxnard Plain and Pleasant Valley basins would be required to meet BMOs; or
- No effective management strategies are implemented and there are no further reductions in pumping allocations – the Lower Aquifer in the south Oxnard Plain and Pleasant Valley basins will degrade until it can no longer be pumped without expensive treatment prior to delivery of the groundwater.

TABLE OF CONTENTS

1.0 INTRODUCTION

The Fox Canyon Groundwater Management Agency (FCGMA) (Figure 1 and Plate 1) is located in Ventura County and encompasses several coastal basins that underlie the cities of Oxnard, Port Hueneme, Camarillo, and Moorpark. The Agency overlies about 118,000 acres (185 sq mi). The FCGMA was initially created to manage the groundwater in both overdrafted and potentially seawater-intruded areas within Ventura County. The prime objectives and purposes of the FCGMA are to preserve groundwater resources for agricultural, municipal, and industrial uses in the best interests of the public and for the common benefit of all water users. Protection of water quality and quantity along with maintenance of long-term water supply are included in those goals and objectives.

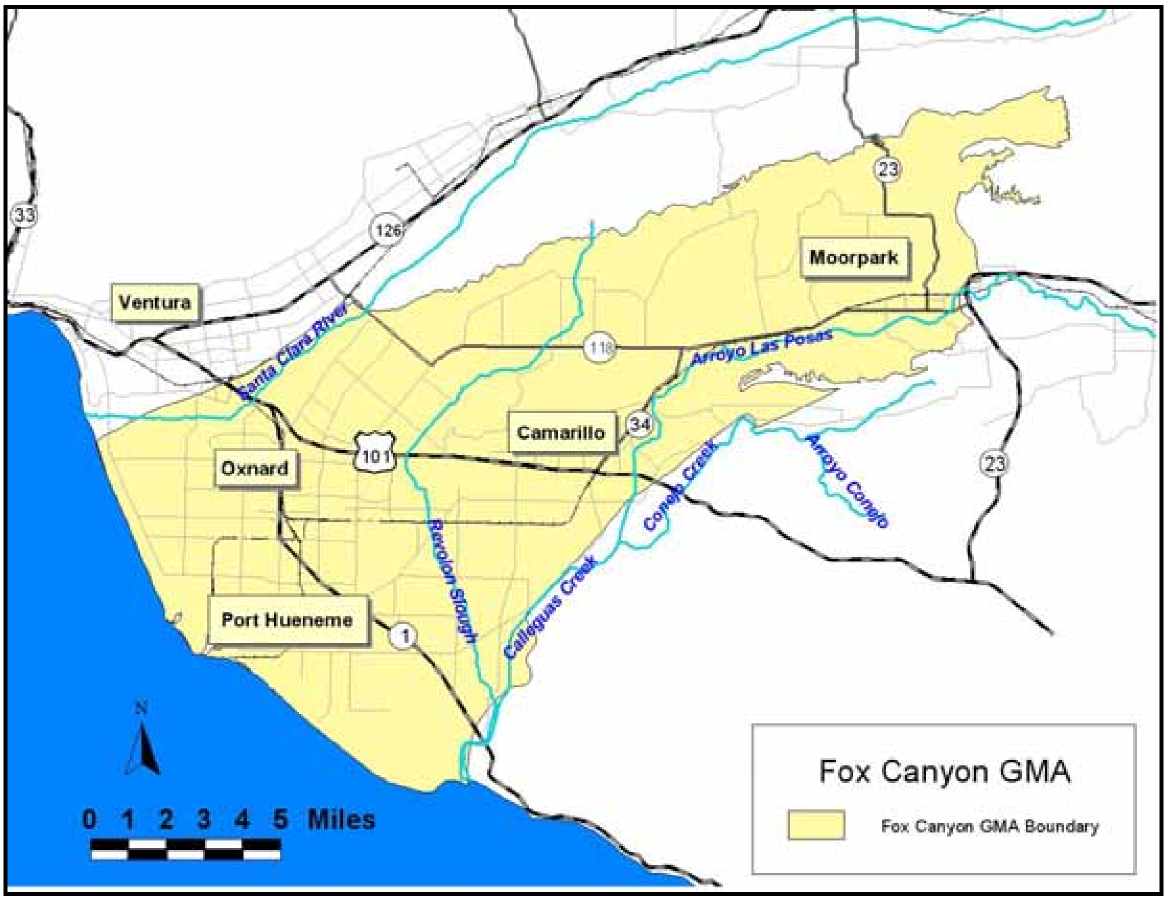

Figure 1. Location map of Fox Canyon Groundwater Management Agency boundary.

The Annotated California Codes Water Appendix, Chapter 121-102 et seq. required the FCGMA to develop, adopt, and implement a plan to control groundwater extractions from the Upper Aquifer System (UAS) to achieve a balanced water supply and demand in the Upper Aquifer System by the year 2000. Additionally, the Water Code required the FCGMA to adopt a Lower Aquifer System (LAS) Management Plan for future extractions from the Lower Aquifer System, including a policy for issuing well permits and a Contingency Plan for seawater intrusion into the Lower Aquifer System. The FCGMA adopted its original Groundwater Management Plan in 1985. The original FCGMA Groundwater Management Plan specified several major items or tasks for accomplishment.

CALLEGUAS WHOLESALE DISTRICT	
SUPPLIER	WATER COMPANY
Calleguas (CAL-001)	ACADEMY MWC
Calleguas (CAL-002)	ARROYO LAS POSAS MWC
Calleguas (CAL-003)	BALCOLM BIXBY MWA
Calleguas (CAL-004)	BERYLWOOD HEIGHTS MWC
Calleguas (CAL-005)	BRANDEIS-BARDIN MWC
Calleguas (CAL-006)	CONEJO TRAILER PARK
Calleguas (CAL-007)	CALIFORNIA WATER SERVICE COMPANY
Calleguas (CAL-008)	CALIFORNIA AMERICAN WATER COMPANY
Calleguas (CAL-009)	CALLEGUAS MWD
Calleguas (CAL-011)	CAMROSA WATER DISTRICT
Calleguas (CAL-012)	CITY OF CAMARILLO
Calleguas (CAL-013)	CITY OF OXNARD
Calleguas (CAL-014)	CITY OF THOUSAND OAKS
Calleguas (CAL-015)	CRESTVIEW MWC
Calleguas (CAL-016)	DEL NORTE MWC
Calleguas (CAL-017)	EPWORTH MWC
Calleguas (CAL-019)	FOXFIELD RIDING CLUB
Calleguas (CAL-020)	FULLER FALLS MWC
Calleguas (CAL-022)	SUNSHINE RANCH
Calleguas (CAL-023)	LA LOMA RANCH MWC
Calleguas (CAL-024)	LAKE SHERWOOD CSD
Calleguas (CAL-025)	LAS LOMAS WATER SYSTEM
Calleguas (CAL-026)	MESA WATER COMPANY
Calleguas (CAL-027)	OAK PARK WATER SERVICE
Calleguas (CAL-028)	OXNARD UNION HIGH SCHOOL DISTRICT
Calleguas (CAL-029)	PLEASANT VALLEY MWC
Calleguas (CAL-030)	RANCHO CANADA WATER COMPANY
Calleguas (CAL-031)	TOM GRETHER FARMS, Inc.
Calleguas (CAL-035)	GOLDEN STATE WATER CO - Simi Valley
Calleguas (CAL-036)	THERMIC MWC
Calleguas (CAL-038)	VENTURA COUNTY WATERWORKS DISTRICT NO. 1
Calleguas (CAL-039)	VENTURA COUNTY WATERWORKS DISTRICT NO. 8
Calleguas (CAL-040)	VENTURA COUNTY WATERWORKS DISTRICT NO.17
Calleguas (CAL-041)	VENTURA COUNTY WATERWORKS DISTRICT NO.19
Calleguas (CAL-042)	WATERS ROAD USERS GROUP
Calleguas (CAL-044)	ZONE MWC
Calleguas (CAL-179)	BUTLER RANCH MWC
Calleguas (CAL-190)	BALCOM CANYON WATER WELL
Calleguas (CAL-195)	EL CAMPEON RANCH
Calleguas(CAL-196)	COMMANCIA RANCH
CASITAS WHOLESALE DISTRICT	
SUPPLIER	WATER COMPANY
Casitas (CAS-046)	CASITAS MWD
Casitas (CAS-047)	CASITAS MWC
Casitas (CAS-048)	CITY OF SAN BUENAVENTURA
Casitas (CAS-049)	DENNISON PARK WATER SYSTEM
Casitas (CAS-051)	GRIDLEY ROAD WATER GROUP*
Casitas (CAS-052)	HERMITAGE MWC
Casitas (CAS-053)	KROTONA INSTITUTE OF THEOSOPHY
Casitas (CAS-054)	MEINERS OAKS CWD
Casitas (CAS-056)	NORTH FORK SPRINGS MWC
Casitas (CAS-057)	OJALA
Casitas (CAS-058)	OLD CREEK ROAD MWC
Casitas (CAS-059)	OVIATT WATER ASSOCIATION
Casitas (CAS-060)	RANCHO del CIELO MWC
Casitas (CAS-061)	RANCHO MATILIJA MWC
Casitas (CAS-062)	RINCON WATER AND ROADWORKS
Casitas (CAS-063)	OJAI WATER CONSERVATION DISTRICT
Casitas (CAS-064)	SENIOR CANYON MWC
Casitas (CAS-065)	SHERIFF'S HONOR FARM
Casitas (CAS-066)	SIETE ROBLES MWC
Casitas (CAS-067)	SISAR MWC
Casitas (CAS-068)	GOLDEN STATE WATER CO - Ojai
Casitas (CAS-069)	SULPHUR MOUNTAIN ROAD WATER ASSOCIATION
Casitas (CAS-070)	TICO MWC
Casitas (CAS-071)	TRES CONDADOS
Casitas (CAS-072)	VENTURA RIVER COUNTY WATER DISTRICT
Casitas (CAS-073)	VILLANOVA ROAD WATER WELL ASSOCIATION
UNITED WHOLESALE DISTRICT	
SUPPLIER	WATER COMPANY
United (U-074)	ALISO MWC
United (U-075)	ALTA MWC
United (U-076)	BEEDY STREET WELL
United (U-079)	BROWNSTONE MWC
United (U-080)	CAMARILLO AIRPORT UTILITY ENTERPRISE
United (U-081)	CHANNEL ISLANDS BEACH COMMUNITY SERVICES DISTRICT
United (U-082)	CITY OF FILLMORE
United (U-083)	CITY OF PORT HUENEME
United (U-084)	CLOVERDALE MWC
United (U-086)	COMMUNITY MWC
United (U-087)	CYPRESS MWC
United (U-088)	SUNSHINE TRAILER PARK
United (U-089)	DEMPSEY ROAD MWC
United (U-091)	SEACOAST COOLING
United (U-092)	ELKINS RANCH COMPANY
United (U-093)	EVERGREEN TRAILER PARK
United (U-094)	FARMER'S IRRIGATION COMPANY
United (U-095)	FILLMORE IRRIGATION COMPANY
United (U-096)	FILLMORE WEST MOBILE HOME PARK
United (U-097)	GARDEN ACRES MWC
United (U-099)	GLENNVIEW MOBILE HOME PARK
United (U-101)	GOODENOUGH MWC
United (U-102)	HAILWOOD, INC.
United (U-103)	CB SOUTH
United (U-104)	POINSETTIA STOCK FARM
United (U-106)	LAKE PIRU RECREATION AREA
United (U-107)	LIMONEIRA ASSOCIATES
United (U-108)	LINDA VISTA JUNIOR ACADEMY
United (U-109)	MIDDLE ROAD MWC
United (U-110)	MONTALVO MWC
United (U-111)	NAVALAIR MOBILEHOME COURT
United (U-112)	NYELAND ACRES MWC
United (U-113)	OCEAN VIEW MWC
United (U-114)	OCEAN VIEW SCHOOL DISTRICT (LAGUNA VISTA SCHOOL)
United (U-115)	OXNARD LEMON MWC
United (U-118)	PLEASANT VALLEY CWD
United (U-121)	RIO MANOR MWC
United (U-122)	RIO PLAZA WATER COMPANY
United (U-123)	RIO REAL/RIO DEL VALLE SCHOOLS
United (U-126)	SAN CAYETANO MWC
United (U-127)	CITY OF SANTA PAULA
United (U-128)	SAVIERS ROAD MWC
United (U-130)	SILVER WHEEL RANCH MOBILE HOME PARK
United (U-131)	SOUTH MOUNTAIN MWC
United (U-132)	SOUTHSIDE IMPROVEMENT CO
United (U-133)	STORKE MWC
United (U-134)	STRICKLAND MWC
United (U-135)	TEAGUE-McKEVETT CO- LIMONEIRA
United (U-136)	THERMAL BELT MWC
United (U-137)	THOMAS AQUINAS COLLEGE
United (U-138)	TIMBER CANYON MWC
United (U-139)	TOBOCK RANCH MWC
United (U-140)	U.S.N.A.S. - Point Mugu
United (U-141)	U.S.N.C.B.C.- Port Hueneme
United (U-142)	UNITED WCD
United (U-144)	VENTURA COUNTY WATERWORKS DISTRICT NO.16
United (U-145)	G.P. RESOURCES
United (U-146)	VENTURA SCHOOL
United (U-147)	VINEYARD AVENUE ACRES MWC
United (U-148)	THE MUTUAL WATER COMPANY OF VINEYARD AVENUE ESTATES
United (U-149)	VINEYARD MWC
United (U-150)	WARRING WATER SERVICE
United (U-181)	PIRU MWC
United (U-183)	VENTURA COUNTY PROPERTY ADMINISTRATOR
United (U-184)	VENTURA COUNTY DEPT. of AIRPORTS
United (U-185)	HARDSCRABBLE MWC
United (U-186)	SESPE AGRICULTURAL WATER
United (U-187)	GUADALASCA MWC
United (U-191)	SANTA CLARA HIGH SCHOOL
United (U-192)	CITRUS MWC
United (U-200)	LLOYD-BUTLER MWC
United (U-201)	OXNARD MWC
United (U-202)	RANCHO SESPE WORKERS IMPROVEMENT ASSOCIATION
United (U-203)	TOLAND ROAD WATER SYSTEM
United (U-204)	THORNHILL MWC
United (U-205)	SANTA CLARA RESOURCES
United (U-206)	HOUWELING'S NURSERY
United (U-207)	PYRAMID FLOWERS
United (U-208)	SATICOY COUNTRY CLUB
United (U-209)	VUJOVICH RANCH
United (U-210)	BOUQUET MULTIMEDIA
SUPPLIERS WITHOUT WHOLESALE DISTRICT	
SUPPLIER	WATER COMPANY
None (W-152)	ANTELOPE VALLEY - EAST KERN WATER AGENCY
None (W-153)	WILSHIRE BLVD. TEMPLE CAMPS & CONFERENCE CENTER
None (W-154)	CAMP SCHEIDECK LODGE
None (W-155)	CAMP THREE FALLS - BSA
None (W-156)	CASTAIC LAKE WATER AGENCY
None (W-157)	CHANNEL ISLANDS NATIONAL MONUMENT
None (W-158)	CHUCHUPATE CAMPGROUND
None (W-159)	CHUCHUPATE RANGER STATION
None (W-160)	COMPTON HUNTING and FISHING CLUB
None (W-163)	HIDDEN VALLEY MWD
None (W-164)	LAZY J. RANCH
None (W-166)	CIRCLE X RANCH
None (W-168)	NEW CAMP BARTLETT
None (W-170)	OZENA RANGER STATION
None (W-171)	PINE MOUNTAIN INN
None (W-174)	SWEETWATER SPRING RANCH
None (W-178)	YERBA BUENA WATER COMPANY
None (W-182)	U.S. NAVY - San Nicolas Island
None (W-188)	POINT MUGU STATE PARK
None (W-193)	LAKE OF THE WOODS MWC
None (W-194)	OZENA VALLEY SPORTSMANS CLUB

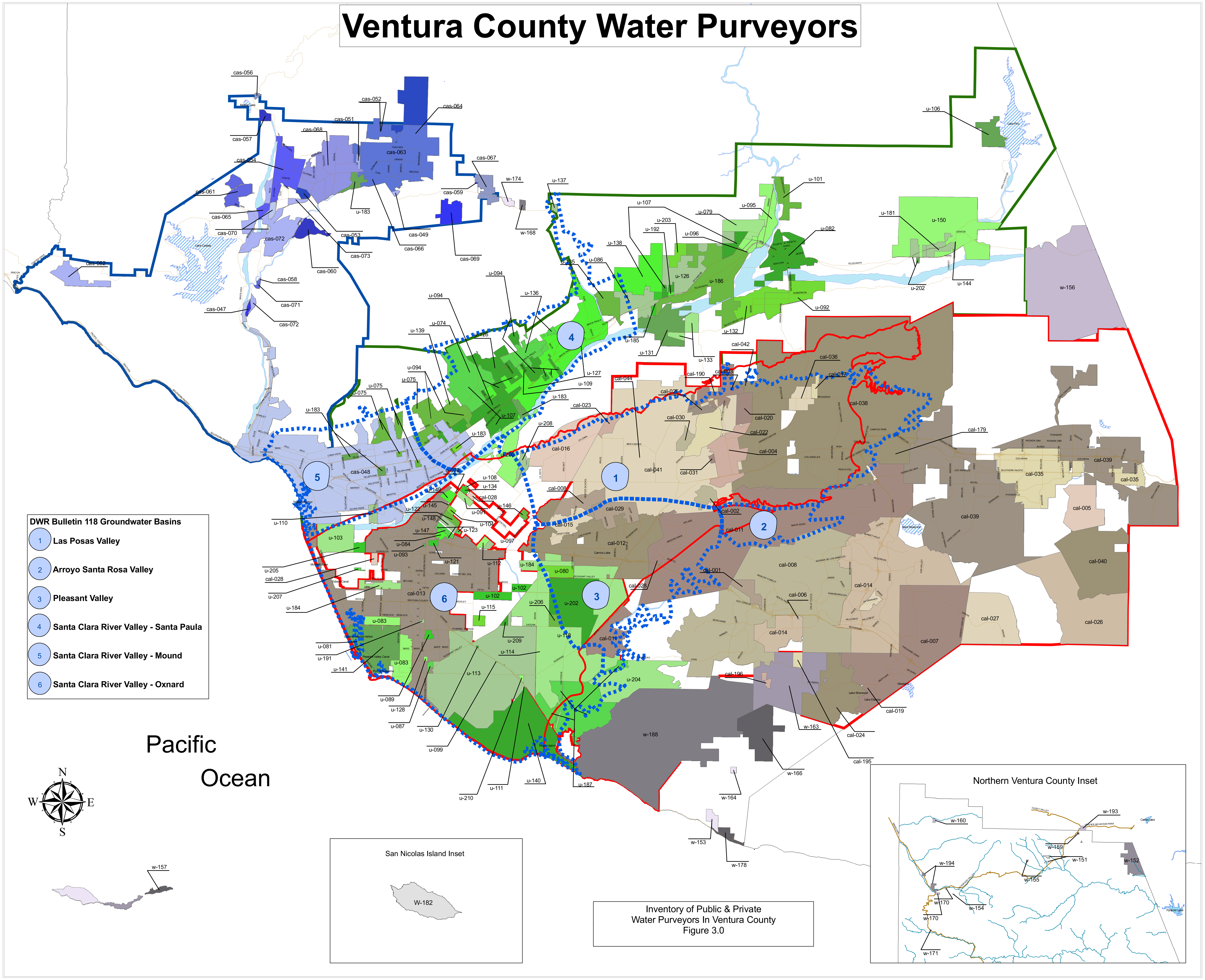

Plate 1

Ventura County Watershed Protection District

Water & Environmental Resources Division
Groundwater Section
800 South Victoria Ave.
Ventura, CA 93009-1600
Ph: (805) 654-2088
Fx: (805) 677-8762

Created: Feb 2006
By: JPD

Legend

- DWR Bull. 118 GW Basins
- FoxCynGMA-bdy
- Roads
- Calleguas MWD
- Casitas MWD
- UWCD
- Water Bodies
- County Boundary

1:87,500

1 inch equals 3 miles

0 1.5 3 6 Miles

At the time of the initial Management Plan development in 1984-1985, the primary threat to the aquifers of western Ventura County was seawater intrusion in the Upper Aquifer System. Since that time, a number of studies have identified other water quality problems, including saline intrusion in the Lower Aquifer System (LAS) in the Pleasant Valley basin, and in the Las Posas basin. This update to the groundwater management plan is designed to look at a broader range of problems and to suggest potential solutions to these problems.

Since 1985, there have been a number of studies conducted within the FCGMA, the most comprehensive being the Regional Aquifer System Analysis (or RASA Study) done by the U.S. Geological Survey (USGS) in the late 1980s and 1990s. This study, conducted with the cooperation of local agencies, consisted of drilling monitoring wells with individual casings perforated in selected aquifers or water-bearing zones, constructing a groundwater model, and conducting hydrogeologic studies. Monitoring wells, most constructed along the coastline of the Oxnard Plain, continued to provide critical information on the status of saline intrusion. In addition, a number of more specific or follow-up studies have been conducted by the United Water Conservation District (UWCD) and other agencies. These studies have helped characterized seawater intrusion along the coastline, saline contamination in more inland areas, and nitrate contamination in the Upper Aquifer System. The USGS MODFLOW groundwater model has been used and refined by the groundwater staff at UWCD to test a variety of projects that could help mitigate the water quality problems within the FCGMA.

This 2007 Update to the FCGMA Groundwater Management Plan incorporates all previous work and the specific studies that were undertaken as part of this most-recent planning process. The Plan is organized with the results of past and current studies followed by an evaluation of both current management strategies and potential future management strategies for the FCGMA. Various groundwater management ideas and strategies have been evaluated first by FCGMA staff, and UWCD staff, and then reviewed by Calleguas Municipal Water District (CMWD) management and staff and consultants from the water purveyors within the FCGMA. Extensive public review by stakeholders was also a critical part of the planning process.

Appendix C includes a document entitled, the East Los Posas Basin Management Plan (ELPBMP). The ELPBMP was developed through ongoing discussions between CMWD and the Las Posas Basin Users Group (farm well owners, mutual water companies, and the Ventura County Water Works Districts that supply water to the City of Moorpark and others). The ELPBMP serves as a more detailed sub-basin management planning document grounded in the FCGMA February 23, 1994 approval of CMWD's Application for Injection/Storage Facilities in the North Los Posas Groundwater Basin. (Appendix C - Exhibit A). As such, the ELPBMP particularly addresses the interaction of CMWD's Aquifer Storage and Recovery (ASR) project with other basin pumpers regarding both basin-wide and local effects of the project.

2.0 BACKGROUND OF GROUNDWATER MANAGEMENT AND OVERDRAFT WITHIN THE FCGMA

Although high chloride levels were first documented near Port Hueneme in the 1930s (California Department of Water Resources [DWR], 1954), the conditions for widespread seawater intrusion on the Oxnard Plain were initiated as early as the 1940s, when groundwater levels beneath the southern portion of the Oxnard Plain basin dropped below sea level (see Appendix A). Within 5 to 10 years, chloride concentrations in wells in the Port Hueneme area started to increase rapidly. At that time, seawater had only affected a few wells in the Port Hueneme area, encompassing an area less than one square mile (Appendix A).

Within 20 years, seawater intrusion in the Port Hueneme area had extended as much as 3 miles inland. In some of the affected wells, chloride concentrations were as high as those of seawater (just less than 20,000 mg/L). Appendix A documents the progression of seawater intrusion beneath the southern portion of the Oxnard Plain basin. This seawater intrusion into the Upper Aquifer System was located adjacent to the Hueneme Submarine Canyon that is directly offshore of Port Hueneme (Figure 2). Seawater intrusion also occurred in the Point Mugu area, adjacent to the Mugu Submarine Canyon that extends offshore from Mugu Lagoon. This intrusion in the Point Mugu area first impacted Upper Aquifer System wells in late 1950s (Appendix A).

In the Port Hueneme area, seawater in the Upper Aquifer System reached its farthest point inland in the early 1980s (Appendix A). Following the high rainfall year of 1983, chloride levels began to decrease in many of the Port Hueneme area wells perforated in the UAS. Coupled with pumping allocations and management strategies imposed by the FCGMA, this improving trend in chloride reductions was accelerated in the 1990s, as the Freeman Diversion was completed by UWCD and several wet years occurred, which allowed increased recharge available from the diversion, helping restore aquifer pressures and pushing seawater back toward the coast.

Groundwater levels in the Lower Aquifer System also dropped below sea level in the late 1950s. This Lower Aquifer System intrusion was first detected in wells in the late 1980s (Appendix A). As with the Upper Aquifer System, the intrusion in the Lower Aquifer System spread into the aquifer both near Port Hueneme and at Point Mugu. Further exacerbating the drops in groundwater levels in the LAS was an increase in production in the Lower System – partly in search of better quality water supplies and partly because new or replacement wells were required to be drilled in the LAS as a strategy to lessen pumping in the intruded Upper Aquifer System.

The overpumping of the aquifers that led to seawater intrusion also created land subsidence of up to 2.2 feet in the Pleasant Valley area north and northwest of Mugu Lagoon by the early 1970s as dewatered clay layers between aquifer zones collapsed from reduced hydrostatic pressures. This subsidence is permanent – refilling of the sand and gravel aquifers cannot force water back into the dewatered clay layers.

In the Point Mugu area (Figure 2), chlorides have not lessened over the past two decades. Instead, chloride concentrations continued to increase in the area of Mugu Lagoon, reaching concentrations almost as high as seawater in some wells. The CM1A monitoring well in that area showed an increase in chloride concentrations from several hundred mg/L to 4,600 mg/L in a little more than one decade.

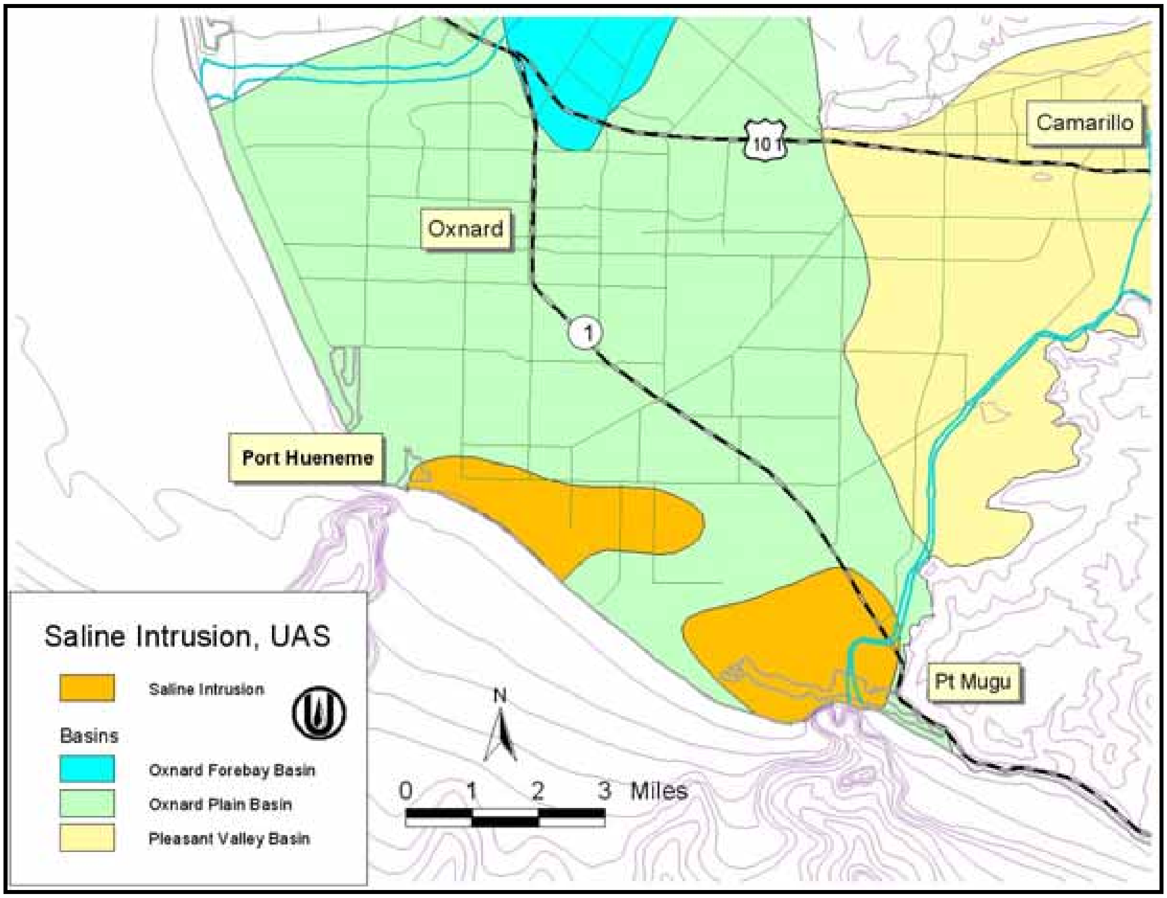

Figure 2. Areas of saline intrusion beneath the Oxnard Plain basin in 2006. The sources of the saline intrusion are discussed in section 5.1.1 *Seawater Intrusion*.

As the USGS began their work in Ventura County in late 1980s, they proposed that the increase in chlorides in the UAS and LAS was caused not just from seawater intrusion but also from the intrusion of saline waters being pulled from surrounding sediments and from deeper depths along fault zones (Izbicki, 1991, 1992; discussed in more detail in section 5.1.1 *Seawater Intrusion*). The cause of this additional saline contamination was the same as for seawater intrusion, that is, very low groundwater levels. This additional saline contamination of groundwater inland from the lobes of seawater intrusion was caused by excessive groundwater pumping and lowered groundwater levels. This finding raised the possibility that saline contamination could occur in inland areas wherever groundwater levels are particularly depressed.

There was some initial concern chloride concentrations measured in some of the producing wells were simply detecting high chloride waters flowing downward from failed well casings. To ensure monitoring results were accurately depicting saline intrusion, a series of monitoring wells were drilled along the coastal portions of the Oxnard Plain. These multiple-completion wells consist of a single well bore containing several smaller-diameter PVC wells completed at varying aquifer depths. These monitoring wells give discrete depth-dependent data from the aquifers and form the basis of much of the current monitoring program.

Several trends in saline intrusion are evident on the south Oxnard Plain. The Port Hueneme lobe of seawater intrusion has decreased considerably in size and chloride concentration in the

Upper Aquifer System. However, Lower Aquifer System chloride concentrations have somewhat increased in this Port Hueneme lobe. In the more southeastern Point Mugu lobe, concentrations of chloride are generally higher than in the past both in the UAS and LAS; the areal extent of the intrusion of seawater is not known with precision. The area affected by saline intrusion from surrounding sediments has increased both in size and in chloride concentration. This increase in size has prompted United Water Conservation District to drill new monitoring wells inboard of this saline intrusion to detect further movement of salts.

Local and State Actions – The increasing seawater intrusion prompted the State Water Resources Control Board to consider adjudication in the early 1980s, with the result that local agencies, working with the State Board, created a series of physical solutions and institutions to tackle the problem. The physical solutions included adding artificial recharge capability for the aquifers and providing additional in-lieu surface water to groundwater pumpers. The institutional solution was the formation of the Fox Canyon Groundwater Management Agency to bring water usage into balance with recharge sources to prevent overdraft conditions.

Formation of the Fox Canyon Groundwater Management Agency – In 1982, State Senate Bill 2995 was approved creating the Fox Canyon Groundwater Management Agency (FCGMA). The agency's activities were defined as "planning, managing, controlling, preserving, and regulating the extraction and use of groundwater within the territory of the agency." That directive also went on to say, "shall not involve itself in activities normally and historically undertaken by its member agencies, such as the construction and operation of dams, spreading grounds, pipelines, flood control facilities, and water distribution facilities, or the wholesale and retail sale of water." This prohibition of water conservation and distribution facilities along with water sales by the FCGMA was clearly meant to delineate the separate powers of the various agencies within the County (see following section).

The FCGMA officially began operations on January 1, 1983 with the County of Ventura contracting to provide staffing and related services to the new agency. In May 1983, Ordinance No. 1 was adopted requiring all wells within the agency to register and begin reporting groundwater extractions. This ordinance also set extraction management fees (at $0.50/AF), becoming the sole source of income to the fledgling agency sans any minor penalty or surcharge fees that would be instituted in later ordinance revisions. Ordinance No. 2 (October 1983) was a short amendment to Ordinance No. 1 establishing semi-annual groundwater extraction reporting to cover the first and second half of each calendar year, with statements due within 30 days following each period.

A groundwater management plan was adopted in 1985 to set goals and to help guide FCGMA policies. In February 1987, Ordinance No. 3 was adopted to require flow meters on all but domestic wells. Ordinance No. 4 (July 1987) soon followed that protected the aquifer outcrop areas in the East and West Las Posas basin (formerly collectively referred to as the North Las Posas basin) and regulated groundwater extractions in the basin via more detailed rules than those in any previous ordinance. The adoption of Ordinance No. 5 in August 1990 completed the first steps for the FCGMA by setting up a system of scheduled extraction reductions, allowing for the use of Historical, Baseline, and Agricultural Efficiency Allocations, and establishing a credit system to encourage cutbacks in pumping, along with a penalty system for overpumping beyond the established annual allocation.

Agencies' responsibilities - Several agencies are responsible for managing water resources in Ventura County. The FCGMA has responsibility for groundwater management planning, managing pumping allocations and credits, and developing policies related to groundwater extractions and recharge. United Water Conservation District (UWCD) has responsibility for managing groundwater resources in seven basins in the county, including most of the basins within the Fox Canyon Groundwater Management Agency (FCGMA) (Plate 1). UWCD's responsibilities include groundwater and surface water monitoring, constructing and maintaining water conservation and recharge facilities, reporting on groundwater conditions, and groundwater management and planning activities. Groundwater management and planning functions overlap between the FCGMA, UWCD, and other local agencies, with the FCGMA focusing on extractions and policy and UWCD focusing on planning and implementing projects. Calleguas Municipal Water District (CMWD) is responsible for providing State Water to portions of Ventura County and providing water management strategies to ensure a reliable source of water for its customers (Plate 1). The Ventura County Watershed Protection District (VCWPD) is responsible for flood control functions, groundwater/surface water monitoring, and water well permitting. The water purveyors (cities and water districts) decide how much and from where their groundwater supplies are extracted, as well as plan projects that benefit the aquifers. There has been a remarkable amount of cooperation among these organizations in addressing groundwater issues over the last 20+ years.

In practice, groundwater management functions within the boundaries of the FCGMA are performed in the following ways:

1. Groundwater levels and groundwater quality sampling and analysis are conducted by UWCD, VCWPD, and individual water purveyors;
2. Groundwater extraction records are collected by both the FCGMA and UWCD, with the FCGMA maintaining records on extraction allocations and credits;
3. An annual report on groundwater conditions is prepared by UWCD within UWCD boundaries and CMWD prepares reports on groundwater conditions within the West, East, and South Las Posas basins (in conjunction with the Las Posas Basin Users Group;
4. Water purveyors prepare regular plans on current and future water use and supplies (e.g., Urban Water Management Plans);
5. The FCGMA prepares this Groundwater Management Plan to evaluate basin management objectives, strategies, and policies;
6. UWCD and some of the water purveyors construct and operate water conservation facilities; and
7. The VCWPD (and the City of Oxnard within its boundaries) oversees all well drilling, well destruction, and monitoring well requirements and permitting.

The initial Groundwater Management Plan (September 1985) prepared by the FCGMA recommended groundwater pumping be reduced by 25% over a 20-year period to help bring the aquifers into balance or to reach safe yield by year 2010 and to mitigate seawater intrusion by that same target date. This plan was based on groundwater demand projections for the period between 1980 and 2010. Subsequent Board ordinances (Ordinance No. 5) formulated an extraction allocation for all groundwater pumpers within the FCGMA, based on average extractions during the years 1985 to 1989. Starting in 1990, these pumping or “Historical” allocations were to be reduced by 5% every five years, with a planned 25% total reduction by the year 2010.

A program of “Conservation” and “Storage” credits allows well operators to vary their annual pumping in accordance with crop changes and/or annual hydrologic conditions. In addition, agricultural pumpers are allowed the option of using Irrigation Efficiency instead of the allocation/credit program. Agricultural efficiency for individual pumpers (later deemed as "operators" of one or more wells) is required to be at least 80% or better (20% or less going to leaching, deep percolation, or runoff), when compared to FCGMA allowed water for particular crop water demand based on daily evapotranspiration and precipitation measurements from a series of weather stations installed throughout the FCGMA. A surcharge fee, based on the extraction reporting, was formulated to penalize individual pumping above allowed annual allocations or not meeting the required irrigation efficiency percentage minimum. These penalties have been seldom used since their inception, largely because of widespread cooperation among pumpers to reduce groundwater extractions.

In cooperation with the Watershed Protection District, the FCGMA also helped formulate requirements that new wells be completed in specific aquifers to help control seawater intrusion. A similar cooperative program that utilized Federal 319(h) grant funds coupled with matching local funds helped destroy a number of abandoned wells across the Oxnard Plain which, had the potential to act as conduits allowing inter-aquifer mixing. A total of 49 old abandoned or leaking wells were destroyed under this program.

3.0 GROUNDWATER BASINS & HYDROGEOLOGY

The basins within the FCGMA are part of the Transverse Ranges geologic province, in which the mountain ranges and basins are oriented in an east-west rather than the typical northeast-southwest trend in much of California and the western United States. Active thrust faults border the basins of the Santa Clara River, causing rapid uplift of the adjacent mountains and downdropping of the basins. The alluvial basins are filled with substantial amounts of Tertiary and Quaternary sediments deposited in both marine and terrestrial (non-marine) settings. The basins beneath the Oxnard Plain are filled with sediments deposited on a wide delta complex formed at the terminus of the Santa Clara River and was heavily influenced by alternating episodes of advancing or retreating shallow seas that varied with world-wide sea level changes over many millions of years.

There are seven main or significant groundwater basins within the FCGMA (Figure 3). These groundwater basins have been called by somewhat different names historically; this Plan uses the terminology of the U.S. Geological Survey from their work in the 1990s and early 2000s (e.g., Hanson et al., 2003) because it is the most recent comprehensive study of the basins. These groundwater basins include the Oxnard Plain, the Oxnard Plain Forebay, the Pleasant Valley, the Santa Rosa, and the East, West and South Las Posas basins. These basins generally contain two major aquifer systems, the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS). Separate aquifers locally named within these systems include the Oxnard and Mugu aquifers (UAS) and the Hueneme, Fox Canyon, and Grimes Canyon aquifers (LAS). A shallower, unconfined aquifer is also present locally underlying rivers and creeks. Underlying the Oxnard Plain and Pleasant Valley basins are sand layers of the "semi-perched zone," which may locally contain poor-quality water. This zone extends from the surface to no more than 100 ft in depth. These sands overlie confining clay of the upper Oxnard Aquifer which generally protects the underlying aquifers from contamination from surface land uses. The Semi-perched zone is rarely used for water supply.

The aquifers are comprised of sand and gravel deposited along the ancestral Santa Clara River, within alluvial fans along the flanks of the mountains, or in a coastal plain/delta complex at the terminus of the Santa Clara River and Calleguas Creek. The aquifers are recharged by infiltration of streamflow (primarily the Santa Clara River), artificial recharge of diverted streamflow, mountain-front recharge along the exterior boundary of the basins, direct infiltration of precipitation on the valley floors of the basins and on bedrock outcrops in adjacent mountain fronts, return flow from agricultural and household irrigation in some areas, and in varying degrees by groundwater underflow from adjacent basins.

LOWER AQUIFER SYSTEM – The Lower Aquifer System (LAS) consists of the Grimes Canyon, Fox Canyon, and Hueneme aquifers (e.g., Figure 6) from the deepest to the shallowest. The LAS is part of the Santa Barbara, San Pedro, and Saugus formations of Plio-Pleistocene age (Hanson et al, 2003). The lowest water-bearing unit of the East Las Posas and Pleasant Valley basins is commonly referred to as the Grimes Canyon aquifer (California Department of Water Resources, 1954; Turner, 1975). The Fox Canyon aquifer underlies all of the groundwater basins beneath the FCGMA, but is most significant in the East and West Las Posas, Pleasant Valley, Oxnard Plain Forebay, and Oxnard Plain basins. The Hueneme aquifer is considered to underlie most coastal areas of the southern Oxnard Plain (Hanson et al, 2003), and is an important source of water in the Oxnard Plain, Pleasant Valley, and the West Las Posas basins.

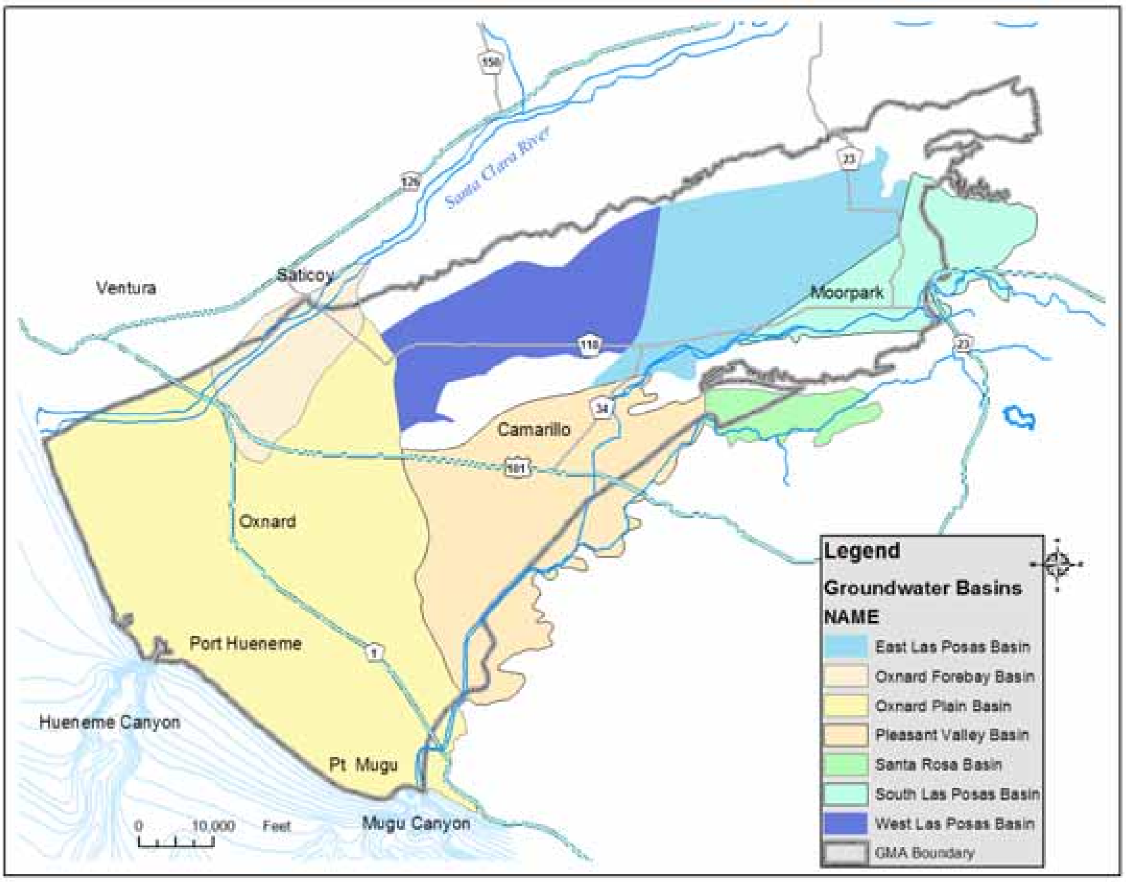

Figure 3. Groundwater basins within the Fox Canyon Groundwater Management Agency.

The aquifers within the LAS are commonly isolated from each other vertically by low-permeability units (silts and clays) and horizontally by regional fault systems. There is active tectonism (faulting and folding) within the area of the FCGMA, caused by compressional and lateral forces as the Transverse Ranges are caught in a vise between the Pacific and North American tectonic plates. As a result, the LAS is folded and tilted in many areas, and has been eroded along an unconformity separating the Upper and Lower aquifer systems.

UPPER AQUIFER SYSTEM – The Upper Aquifer System (UAS) within the FCGMA consists of the Mugu and Oxnard aquifers (Figure 5, Figure 6), from deepest to most shallow, of Late Pleistocene and Holocene age. The UAS rests unconformably on the Lower Aquifer System, with basal conglomerates in many areas (Hanson et al, 2003). In the Oxnard Plain, these coarse-grained basal deposits have been referred to as the Mugu aquifer (Turner, 1975). The Mugu aquifer is generally penetrated at a depth of 255 ft to 425 ft below land surface. The younger Oxnard aquifer is present throughout the Oxnard Plain. The Oxnard aquifer is the primary aquifer used for groundwater supply on the Oxnard Plain. This highly-permeable assemblage of sand and gravel is generally found at a depth of approximately 100 ft to 220 ft below land surface elevation.

OXNARD PLAIN FOREBAY AND OXNARD PLAIN BASINS – Both Upper and Lower aquifers are present in the Oxnard Plain Forebay and Oxnard Plain basins (Figure 4). The Oxnard Plain basin extends several miles offshore beneath the marine shelf, where outer edges of the aquifer are in direct contact with seawater. In areas near Port Hueneme and Point Mugu where submarine canyons extend nearly to the coastline (Figure 2, Figure 7), the fresh-water aquifers are in direct contact with seawater only a short distance offshore.

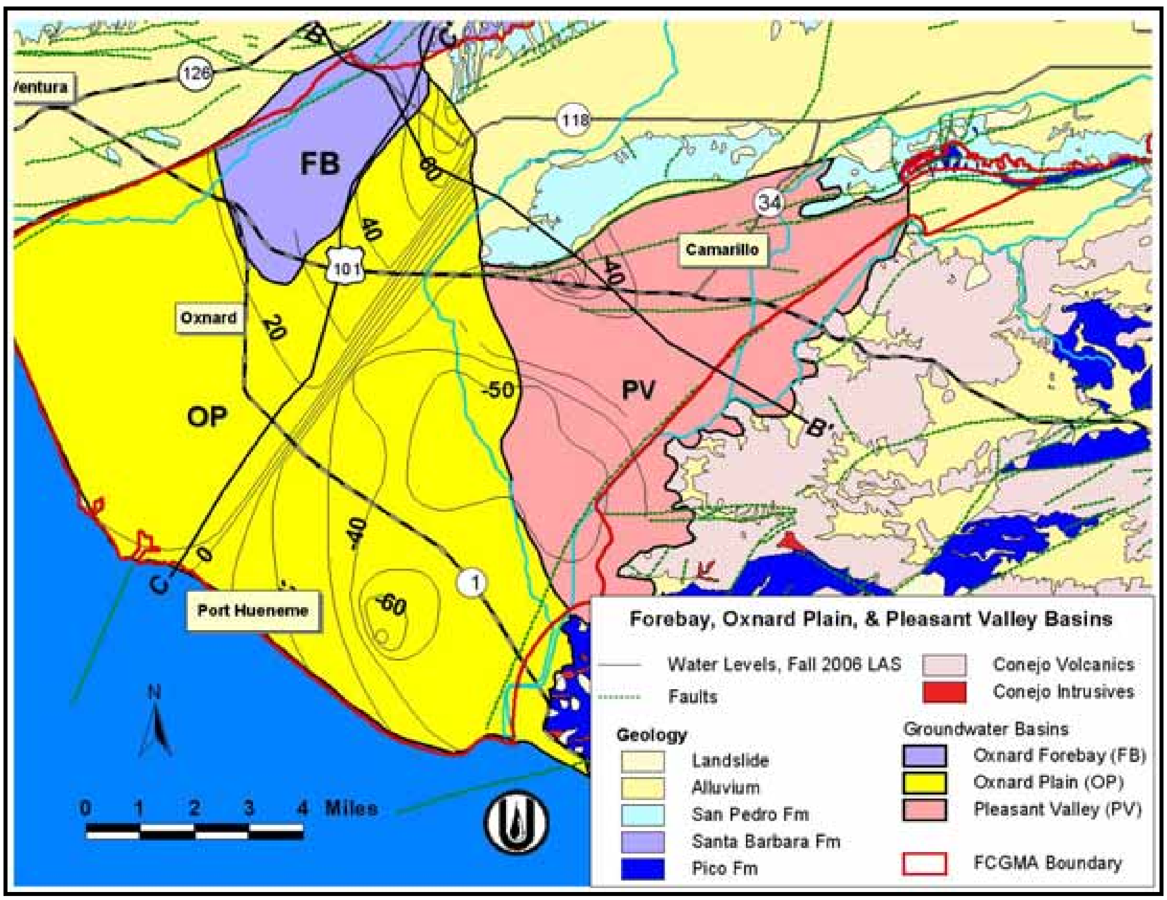

Figure 4. Map of Oxnard Forebay, Oxnard Plain, and Pleasant Valley basins. Contours of Lower Aquifer groundwater elevations in the Fall of 2006 indicate that the south Oxnard Plain and Pleasant Valley basins have significant areas below sea level. The locations of geologic sections B-B' (Figure 5) and C-C' (Figure 6) are indicated on map.

The Oxnard Plain Forebay basin is the main source of recharge to aquifers beneath the Oxnard Plain. The absence of low-permeability confining layers (no continuous clay or silt layers) between surface recharge sources and the underlying aquifers (sand and gravel layers) in the Forebay basin allows for effective recharge of the basin and subsequent recharge of aquifers further to the south and southwest (e.g., Figure 6). Recharge to the Forebay basin comes from a combination of percolation of Santa Clara River flows, artificial recharge from United's spreading grounds at Saticoy and El Rio, agricultural and household irrigation return flows, percolation of rainfall, and lesser amounts of underflow from adjacent basins. In the area of the Forebay between the El Rio and Saticoy spreading grounds, the Lower Aquifer System has been folded and uplifted and then truncated (eroded away) along its contact with the Upper Aquifer System (Figure 5, Figure 6). In this area, recharge from surface sources may enter both the Upper Aquifer System and the underlying Lower Aquifer System. It is estimated that about 20% of the water recharged to this area reaches the Lower Aquifer System, with the remainder recharging the Upper Aquifer System (Hanson, 1998).

The Oxnard Plain Forebay basin accepts large quantities of recharge water in a single year, and the basin was filled to near-capacity during several recent wet years (UWCD, 2003). High groundwater elevations in the Oxnard Plain Forebay basin increase the hydraulic head (pressure) in the confined aquifers of the Oxnard Plain, raising water levels throughout the Plain and promoting natural offshore flow in coastal areas.

The Oxnard Plain Forebay basin is hydrologically connected with the aquifers of the Oxnard Plain basin (e.g., Figure 6). Thus, the primary recharge to the Oxnard Plain basin is from underflow from the Forebay rather than the deep percolation of water from surface sources on the Plain. When groundwater levels are below sea level along the coastline, there may also be significant recharge by seawater flowing into the aquifers (from the historic discharge areas shown in Figure 7 where the aquifers are exposed on the sea floor). When Lower Aquifer System (LAS) water levels are substantially lower than Upper Aquifer System (UAS) water levels (creating a downward gradient), there may be substantial leakage of UAS water into the LAS both through discontinuities within the silts and clays between aquifers on the Oxnard Plain and as slow vertical percolation directly through the silt and clay material itself. Some amount of downward percolation can also occur via wells that are perforated in both aquifer systems and via compromised (failed or leaking) well casings.

One of the more recent findings associated with groundwater beneath the Oxnard Plain basin is a zone with a steeply-dipping groundwater gradient in the Lower Aquifer System that extends across the Oxnard Plain from just south of Port Hueneme northeastward to the south flank of the Camarillo Hills (Figure 4, just south of section C-C'). This steep gradient is apparently caused by a lower-conductance zone that bisects the Oxnard Plain at the depth of the Lower Aquifer System (e.g., UWCD, 2003). This zone, likely a fault or other structural feature, reduces recharge flowing from the Oxnard Plain Forebay basin to the south Oxnard Plain and Pleasant Valley. This zone may be an extension of the Simi-Santa Rosa fault that extends along the southern flank of the Camarillo Hills. The presence of this subsurface feature that reduces groundwater flow also limits the effectiveness of management strategies that rely on groundwater flowing in the LAS from recharge areas in the Oxnard Plain Forebay basin to the south Oxnard Plain and to Pleasant Valley. This Management Plan proposes specific strategies to overcome this geologic hurdle to recharging the LAS in these southern areas of the FCGMA.

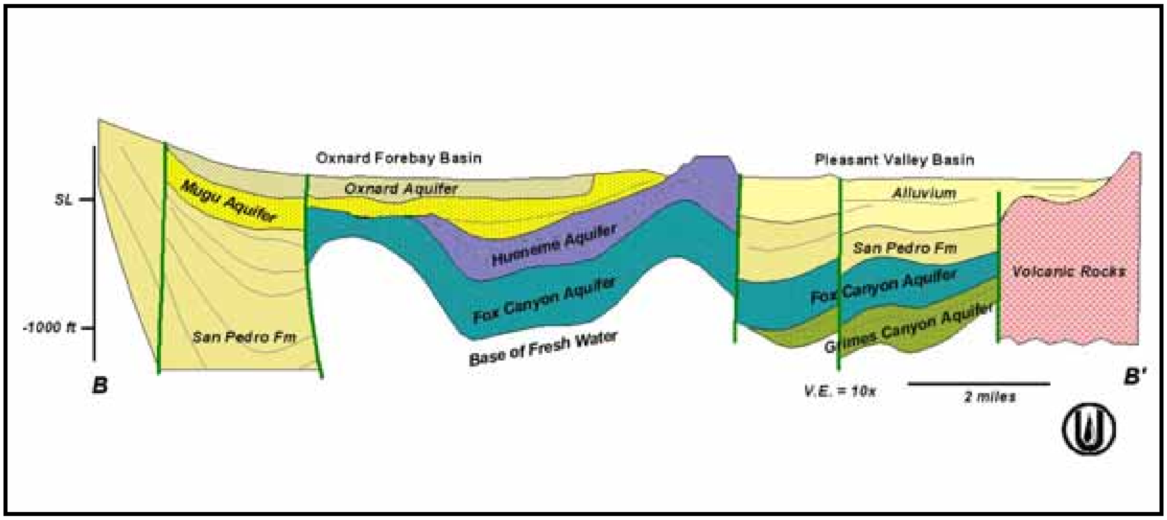

Figure 5. Geologic section B-B'. Simplified from Mukae and Turner (1975). Note ten times vertical exaggeration to accentuate stratigraphic units.

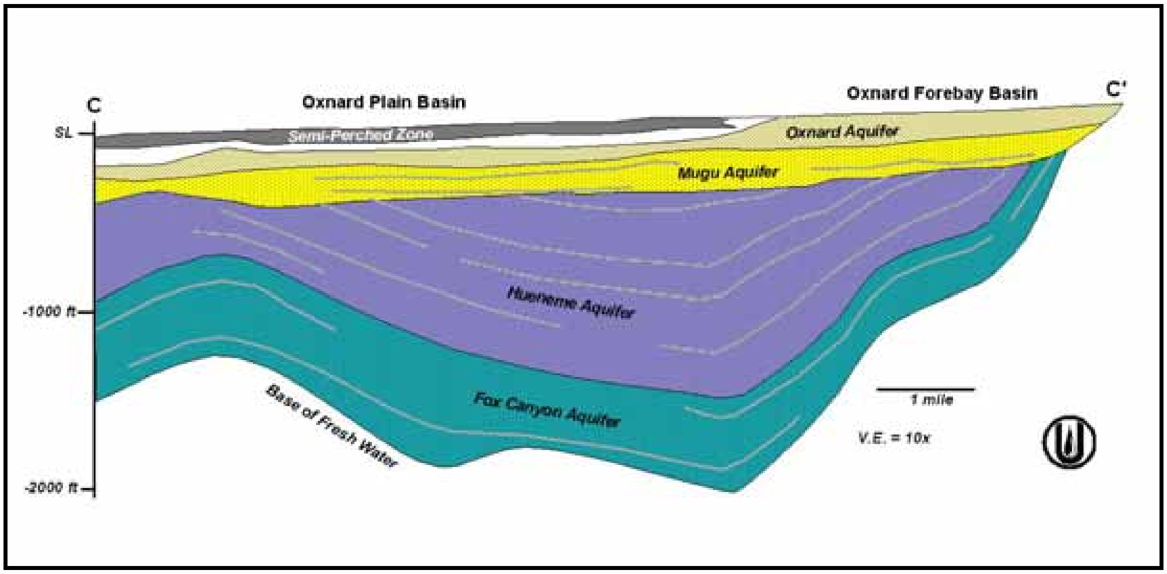

Figure 6. Geologic section C-C'. Simplified from Mukae and Turner (1975). Note ten times vertical exaggeration to accentuate stratigraphic units.

PLEASANT VALLEY BASIN – The Pleasant Valley groundwater basin (Figure 4) has been historically differentiated from the Oxnard Plain basin by a general lack of Upper Aquifer System aquifers (Turner, 1975). However, there may be local water-producing Upper Aquifer System units within the Pleasant Valley basin (Turner, 1975; Hanson et al, 2003). The Pleasant Valley basin is confined by thick fine-grained deposits overlying the aquifers of the basin. The Fox Canyon aquifer is the major water-bearing unit in the basin. Despite the fault barrier to the west, the Lower Aquifer System is in hydrologic continuity with the adjacent southern portion of the Oxnard Plain basin.

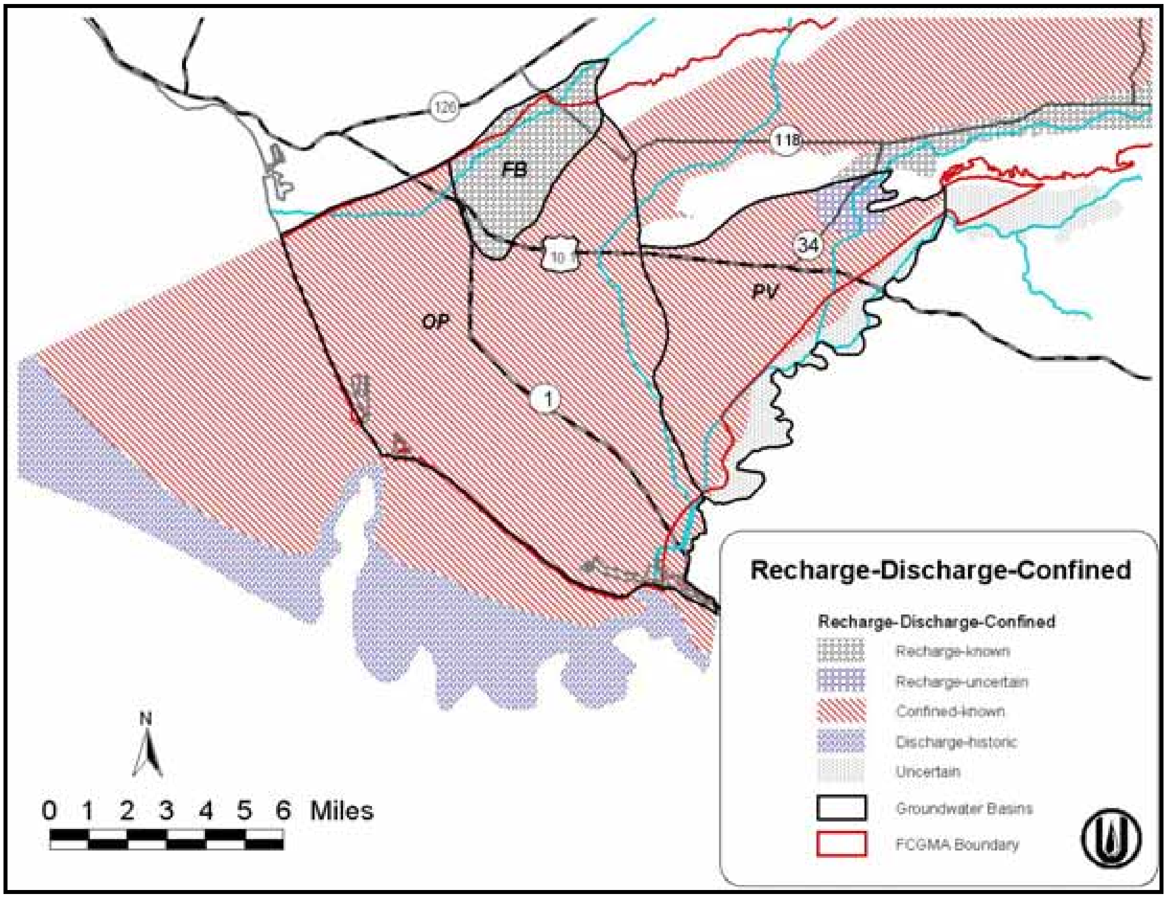

Figure 7. Recharge and discharge areas of coastal aquifers, with confined portions of the aquifers indicated. The offshore discharge area is the location where the aquifers are exposed on the ocean bottom and in submarine canyons. See text for discussion. Basin designations: OP-Oxnard Plain, FB-Oxnard Forebay, PV-Pleasant Valley.

Historically it was assumed that the LAS of the Pleasant Valley Basin was relatively confined and received little overall recharge across the fault that extends from the Camarillo Hills to Port Hueneme. However, since the early 1990s, water levels have begun to rise in the northern adjacent basins. The City of Camarillo has two existing wells in the northeast portion of the Pleasant Valley Basin (hereafter called the Somis Area) and these wells confirm that rising water levels in northern adjacent basins directly impact recharge rates, water quality, and water levels in the Somis Area. The recharge in the Somis Area may be a result of uplift and folding of Lower Aquifer units that allow rapid stream flow percolation. This area is indicated as "Recharge-uncertain" at the north end of the Pleasant Valley basin on Figure 7 to reflect the uncertainty of the extent of this area of recharge. It is recommended that additional monitoring and studies be conducted to determine the dimensions and nature of this apparent recharge area.

The groundwater hydrology of the portion of the Pleasant Valley basin east of the city of Camarillo is not well understood because there are not many wells drilled in the area. Along Calleguas Creek near California State University Channel Islands, water has been produced historically from aquifer depths that are shallower than the typical LAS well, suggesting that water-bearing strata are not limited to the LAS in this area.

It is clear that the eastern and northeastern portions of the Pleasant Valley basin need to be better understood (indicated as “Unknown” along the eastern edge of the Pleasant Valley basin on Figure 7). Past studies have considered the basin as largely confined, with perhaps some perched water along a portion of its eastern edge. The conceptual hydrogeology that was the basis for the Ventura Regional Groundwater Model used the conclusions from these studies. As suggested above, additional monitoring and studies are needed to better determine the hydrogeology of the area, with these results integrated into the groundwater model.

SANTA ROSA BASIN – The Santa Rosa basin (Figure 8) is the smallest basin within the FCGMA. Groundwater levels are heavily influenced by flows in the overlying Conejo Creek; discharges from a wastewater treatment plant and dewatering wells in Thousand Oaks have considerably increased year-round flows in the creek. Aquifers in the basin include a shallow alluvium aquifer and portions of the Lower Aquifer System. The structure of this basin is dominated by the east-trending Santa Rosa syncline that folds the San Pedro and Santa Barbara Formations (CSWRB, 1956). This syncline helps direct groundwater flow in the San Pedro Formation. The Santa Rosa fault zone forms a barrier to groundwater flow into the basin from the north. A sharp change in water level in the western part of the basin may be caused by a roughly north-trending fault that restricts groundwater flow (CDWR, 2003). Elevated nitrate and sulfate have been a problem in the basin.

LAS POSAS BASIN –The Las Posas groundwater basin (Figure 8) is bounded on the south by the Camarillo and Las Posas Hills and on the north by South Mountain and Oak Ridge (CSWRB, 1954). The basin has been variously subdivided into North and South basins (e.g., Turner and Mukae, 1975) or by West, East, and South basins (e.g., Hanson, 1998). The U.S. Geological Survey terminology (Hanson, 1998) is used in this Management Plan. Productive aquifers in this basin include a shallow unconfined aquifer that is most transmissive along the Arroyo Las Posas and a lower confined aquifer system that is considered to be the equivalent of the Lower Aquifer System on the Oxnard Plain (Figure 9).

South Las Posas Basin – This basin is separated from the East Las Posas basin by an east-trending anticline (fold) that affects all but the shallowest alluvium (Figure 9). This fold may affect groundwater flow between the East and South Las Posas basins at some aquifer depths, although recharge from the South Las Posas basin flows readily into the East Las Posas basin at Lower Aquifer System (LAS) depths. To the south, the Springville and Santa Rosa fault zones produce disrupted and tightly folded rocks along the edge of the basin, restricting groundwater flow to the south (CSWRB, 1956). There is a shallow alluvial aquifer that follows the trend of Arroyo Las Posas as it crosses the South Las Posas basin; this shallow aquifer is in hydrologic connection with the underlying LAS and is the main source of recharge to the LAS (indicated as the recharge area along the south edge of the East and South Las Posas basins on Figure 10).

There has been a significant change in average groundwater levels over the past 40 years in the South Las Posas basin, with groundwater levels rising more than 100 ft during this period. The mechanism for this rise in groundwater elevations is the increased recharge from percolation beneath the Arroyo Las Posas as discharges from the Moorpark and Simi Valley wastewater treatment plants and dewatering wells in Simi Valley have increase year-round flow in the arroyo. The entire alluvial aquifer near the arroyo has progressively filled to the elevation of the arroyo, starting in the easternmost portion of the basin in the 1960s and moving westward through the 1990s (Bachman, 2002). Water from the filled alluvial aquifer has percolated downward into the underlying Lower Aquifer System, creating a recharge mound in the Lower

Aquifer System that extends from the arroyo northward into the East Las Posas basin (CH2MHill, 1993; Bachman, 1999).

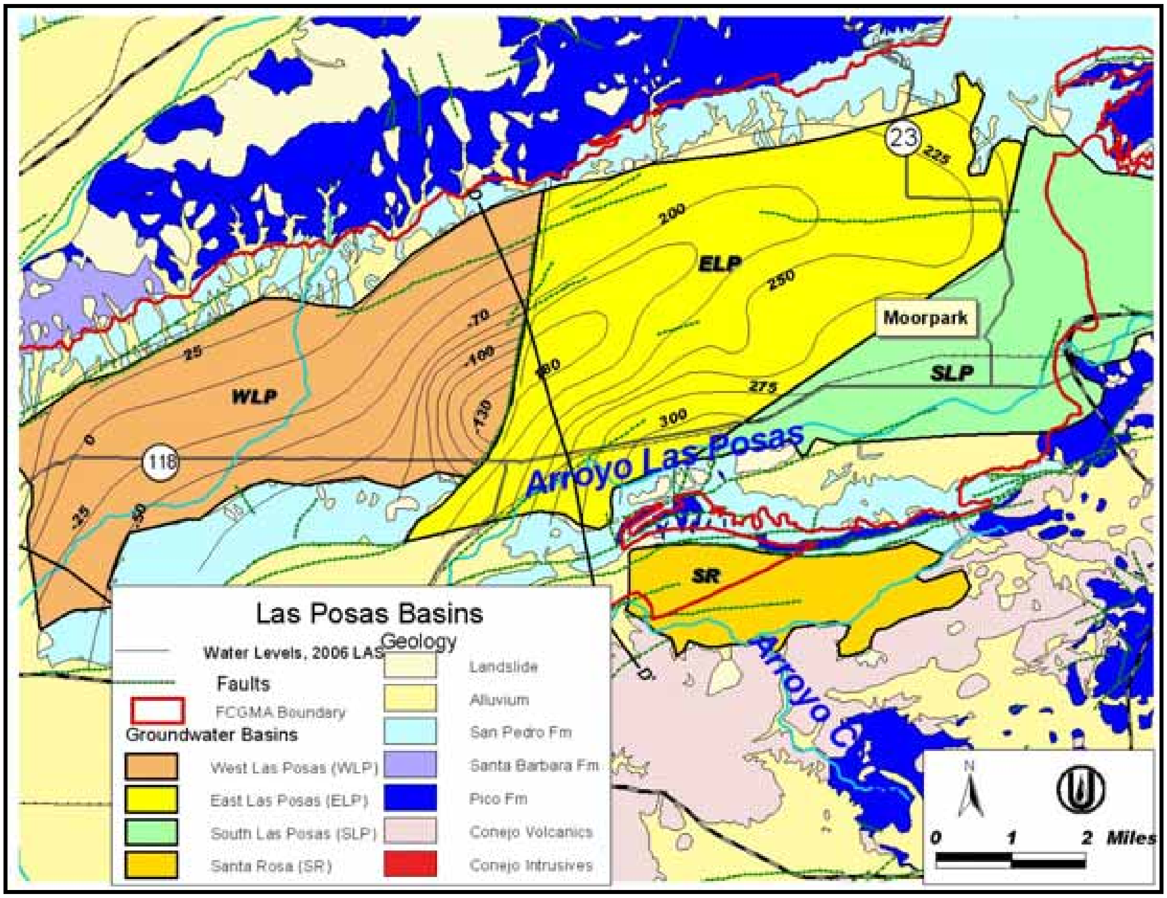

Figure 8. Map of Las Posas and Santa Rosa basins. Contours of Lower Aquifer groundwater elevations in 2006 indicate the recharge mound along Arroyo Las Posas and the change in groundwater elevations across the fault that forms the boundary between the West and East Las Posas basins. The location of geologic section D-D' (Figure 9) is indicated on the map.

Salts (i.e., chloride, sulfate) in the groundwater have increased in the South Las Posas basin and the southwestern portion of the East Las Posas basin as the shallow aquifer filled along Arroyo Las Posas. These salts apparently were leached from the shallow aquifer as groundwater levels reached record highs, saturating sediments that have been unsaturated for the historic period. These salts apparently migrated vertically with percolating groundwater into the LAS and then laterally into the main portion of the East Las Posas basin as the recharge mound developed. Some of this groundwater is unsuitable for irrigation without being blended with better-quality water.

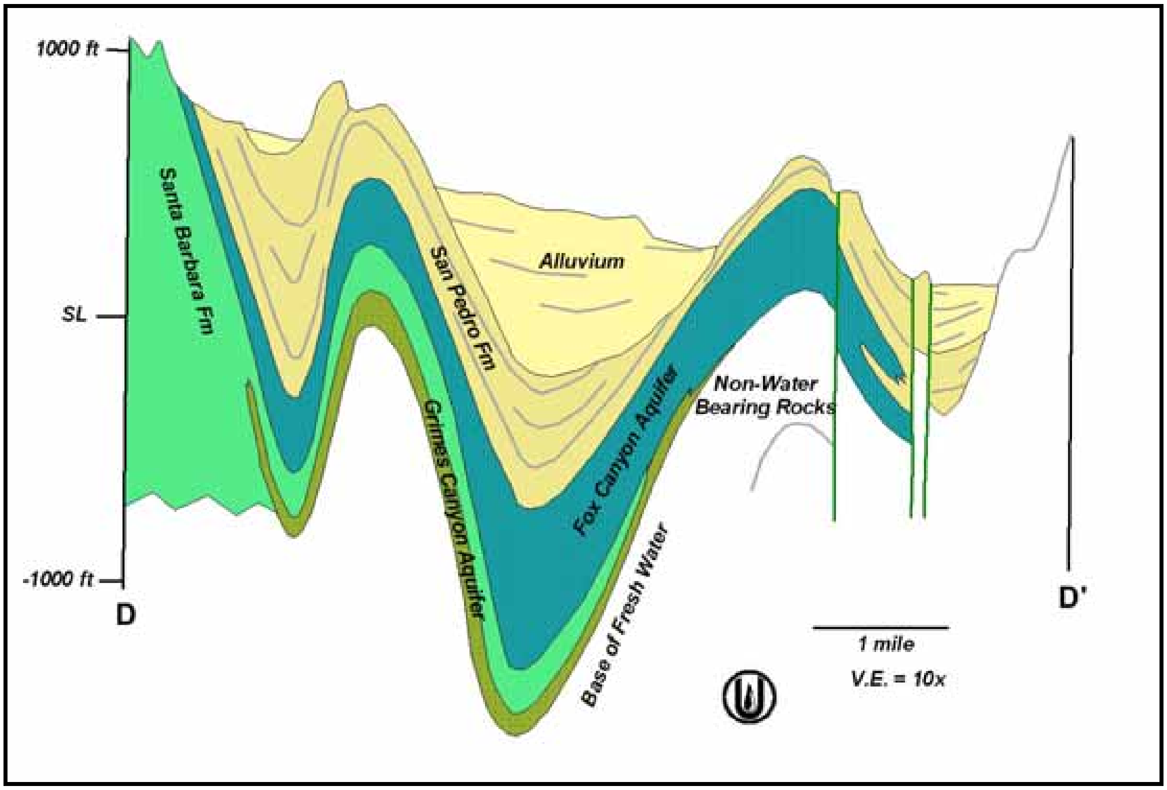

Figure 9. Geologic section D-D'. Simplified from Mukae and Turner (1975). Note ten times vertical exaggeration to accentuate stratigraphic units.

East Las Posas Basin – The East Las Posas basin is separated from the West Las Posas basin by a north-trending unnamed fault running through Somis (CH2MHill, 1993; Hanson, 1998), across which groundwater levels differ by as much as 400 feet (Figure 8). The fault also acts as a barrier to transport of saline waters from the East Las Posas basin to the West Las Posas basin (Bachman, 1999).

The source of recharge to the East Las Posas basin has changed significantly since urban development of the Simi Valley and Moorpark areas over the last 30 years. Prior to this time, recharge was predominantly from rainfall on outcrop areas and from percolation of winter floodwater along the Arroyo Las Posas. Geochemical studies show that groundwater in the central portion of the East Las Posas basin is hundreds to thousands of years old (Izbicki, 1996b), indicating a slow rate of historical recharge along the flanks of the basin. As discussed for the South Las Posas basin, urban development has brought increased discharges of both treated wastewater and shallow groundwater into Arroyo Las Posas, providing a year-round recharge source for the South and East Las Posas basins (CH2MHill, 1993; Bachman, 2002). This increased percolation from the arroyo has created a recharge mound that extends northward into the East Las Posas basin, where groundwater levels have risen by 125 ft to 200 ft during the past 30 years.

Conversely, pumping in the basin has resulted in falling groundwater levels in the eastern portion of the basin, away from the recharge mound. The largest drop in groundwater levels (190 ft) over the period 1973 to 1998 occurred in this region (Bachman, 1999). Groundwater levels have stabilized somewhat across the basin since the late 1990s, at least in part because of the addition of in-lieu and injected recharge by CMWD as part of the Las Posas Basin Aquifer Storage and Recovery (ASR) project.

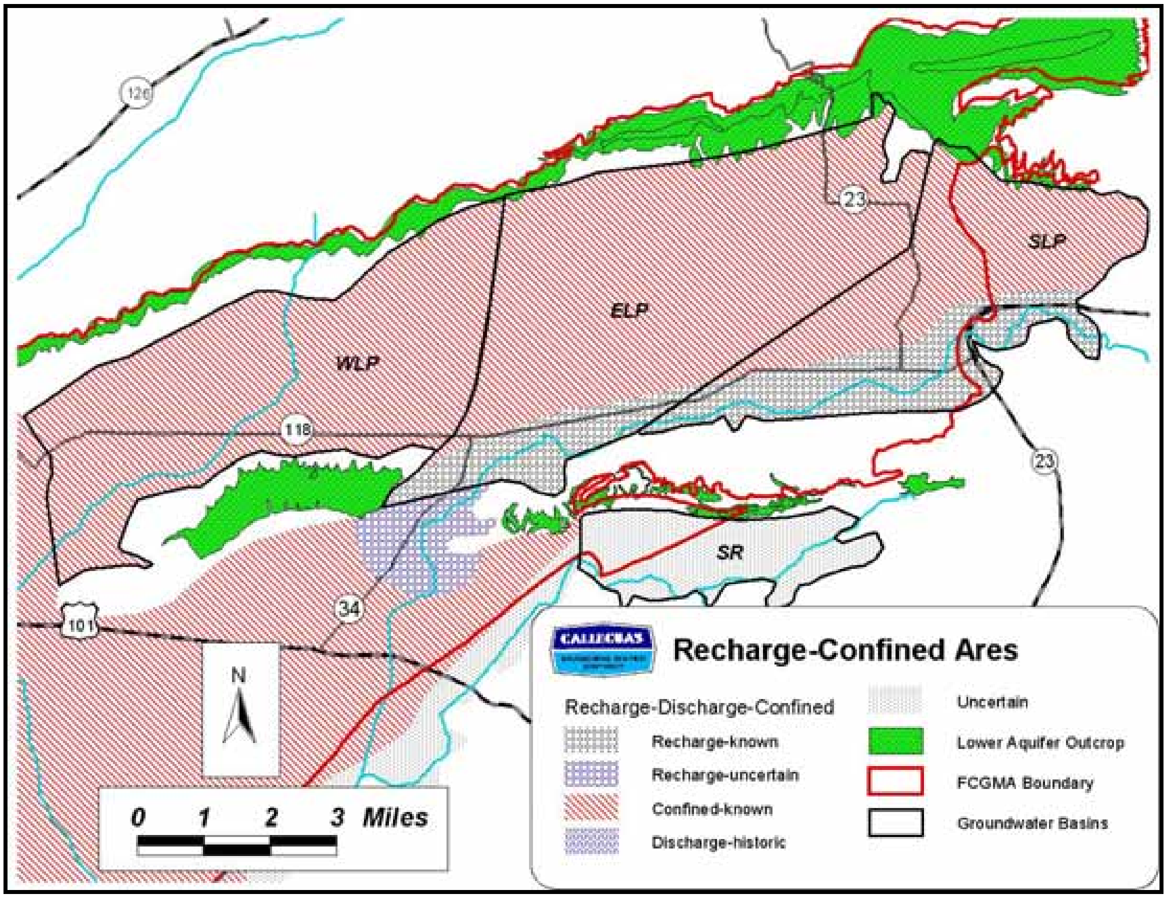

Figure 10. Recharge and discharge areas of Las Posas and Santa Rosa basins, with confined portions of the aquifers indicated. See text for discussion. Basin designations: WLP-West Las Posas, ELP-East Las Posas, SLP-South Las Posas, SR-Santa Rosa.

West Las Posas Basin – The West Las Posas basin (Figure 8) is isolated from the recharge sources of the East and South Las Posas basins by the north-south fault discussed in the previous paragraphs. Instead, the West Las Posas basin is hydrologically connected to the Oxnard Plain basin, with groundwater levels in the western portion of the basin rising and falling with wet and dry climatic cycles of recharge. Groundwater elevation contours are interpreted to extend continuously in the LAS from the Oxnard Plain basin into the West Las Posas basin, suggesting that there is no hydrologic boundary at the western end of the basin. Instead, the western boundary of the basin is defined by surface features – the end of the Las Posas Valley and the beginning of the flat terrain of the Oxnard Plain.

In the eastern portion of the basin, just to the west of the north-trending fault at Somis, a groundwater level trough that was 35 ft below sea level in 1973 had dropped to 150 ft below sea level by 1998 (the trough has since stabilized, with a slight rise in groundwater levels during the last several years). Groundwater elevations slope from their highest point at the western end of the basin to their lowest point at the eastern end of the basin, indicating that recharge water flows from the Oxnard Plain eastward into the basin. There is a flow component from the northern flank of the basin, suggesting that there is also significant mountain-front recharge.

4.0 GROUNDWATER EXTRACTIONS

The FCGMA has collected records of extraction for wells within the Agency for semi-annual periods since 1985. These extraction records are entered into a computer database, and individual wells that reported any pumping between 1985 and 1989 (known as the FCGMA "Base Period") have been assigned Historical Allocations based on those extractions. These extraction records are also used to calculate Conservation Credits and to determine pumping trends within the FCGMA.

Extractions vary from year to year (Figure 11) based largely on the amount (Figure 12) and patterns of rainfall for agricultural uses and the ratio of groundwater to imported water ordered by M&I providers in any year. This year-to-year variation makes it difficult to compare pumping from one year to the next without factoring in these climate and policy variations. However, now that there are historic records available that were gathered over at least a 20-year period, similar climatic years can be compared to determine general trends in pumping. For instance, a comparison of the dry years 1987 and 2002 (the two driest years during the 20-year period, Figure 12) indicates that overall reported pumping declined by about 37,000 acre-feet per year (164,700 to 127,700 AFY) within the Agency. Likewise, comparing average precipitation years 1988 and 2000 (Figure 12) indicates that reported pumping was reduced by 36,800 acre-feet per year (160,500 to 123,700 AFY).

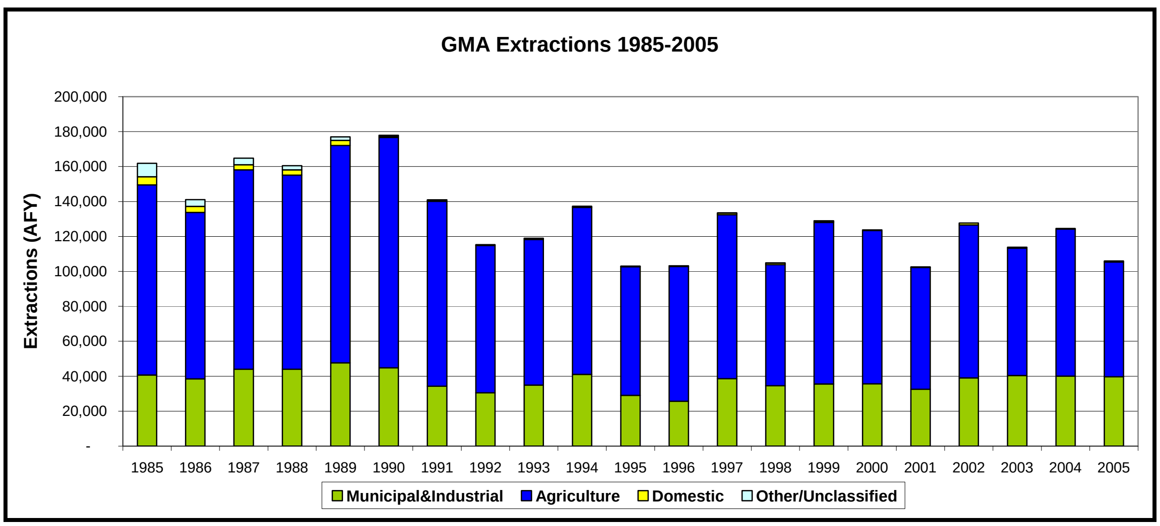

Figure 11. Reported extractions within the FCGMA for years 1985 to 2005.

This apparent decreasing trend in FCGMA pumping occurred in different fashions for agriculture and M&I. Agricultural pumping decreased earliest, following the end of the 1986-1991 drought. This decrease in agricultural pumping has also been documented by UWCD (2002) in a study of agricultural efficiencies within the FCGMA. The increased irrigation efficiency is likely the result of improved irrigation systems such as drip tape and micro sprinklers that were installed within that time frame. A portion of the decrease in agricultural pumping can also be attributed to land conversion to urban uses (see discussion below) and increased yields from the Freeman Diversion and the Conejo Creek project that supplied growers an alternative water source to pumped groundwater.

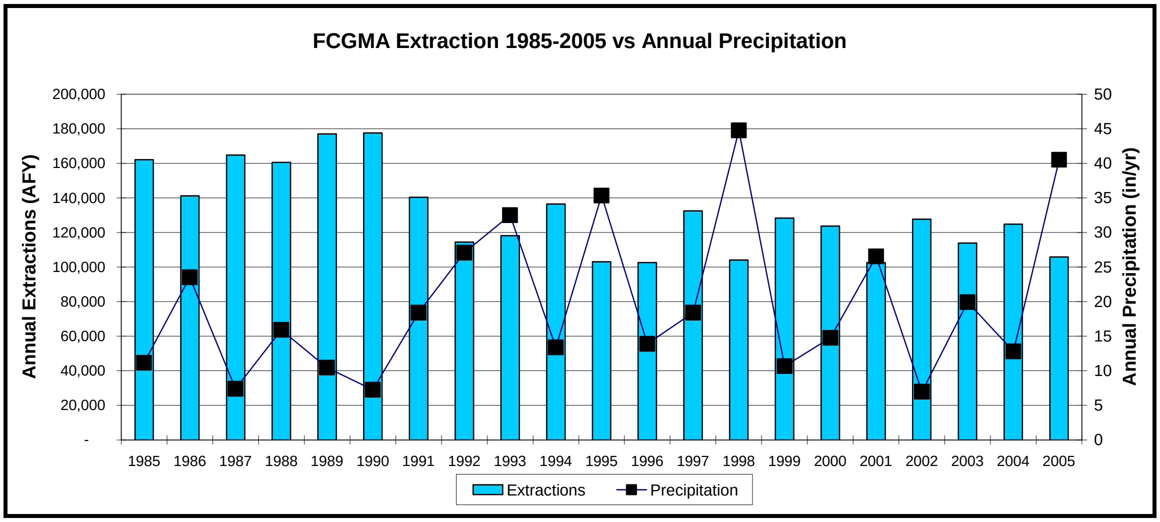

Figure 12. FCGMA extractions plotted against annual precipitation to indicate the general correlation between rainfall and extractions.

Municipal and Industrial (M&I) pumping is somewhat less affected by annual rainfall changes than agricultural irrigation. M&I pumping has been relative flat, with an average of 40,000 AFY pumped during the first decade of FCGMA reported pumping (1985-1994) and an average of 38,300 AFY pumping during the past five years (2001-2005). However, this flat pumping trend occurred as overall urban acreage increased (with an accompanying increase in potential water demand) as agricultural land has converted to urban use. An analysis of changes in land use during the period between aerial photos taken in 1998 and 2002 indicates that about 1,150 acres converted from agriculture to M&I in the Oxnard Plain and Pleasant Valley areas. At the FCGMA conversion rate of two AFY per acre, that represents about 2,300 AFY of new allocation to M&I during this four-year period.

5.0 WATER QUALITY ISSUES

Water quality issues are discussed in two parts: current issues that are evident today and potential future threats that could occur within the basins of the FCGMA if proactive steps are not taken now through management strategies.

5.1 CURRENT WATER QUALITY ISSUES

Seawater intrusion has long been the primary water concern within the FCGMA and was the problem for which the FCGMA was originally formulated to help fix. The intrusion occurs exclusively along the coastline in the Oxnard Plain basin. The U.S. Geological Survey also identified another type of saline intrusion on the Oxnard Plain – salts moving from the surrounding marine clays and older geologic units as pressure in the aquifers is reduced from overpumping. This type of intrusion may also be occurring on a minor scale in the Pleasant Valley basin. Chloride has also become a problem along Arroyo Las Posas, where groundwater from an area in the East and South Las Posas basins must be blended with lower-chloride water to meet irrigation suitability. This problem appears to have migrated downstream, with some of the City of Camarillo's wells now affected.

Chloride is also a problem in the Piru basin near the Los Angeles County line, where high chlorides from discharge of wastewater treatment plants along the Santa Clara River have degraded the recharge water for the basin. This chloride problem is currently isolated to the Piru basin, although long-term recharge of poorer quality water could eventually move through the groundwater basins along the Santa Clara River and reach the Freeman Diversion.

High nitrate concentrations in groundwater are a localized problem in the Oxnard Plain Forebay and Santa Rosa basins. In and adjacent to the Forebay, nitrates affect drinking water wells of UWCD's Oxnard-Hueneme wellfield, mutual water companies, and the City of Oxnard, particularly during and following dry periods.

5.1.1 Seawater Intrusion

High chloride levels from intrusion of seawater were induced by lowered groundwater levels that formed a distinct pumping trough in the southern Oxnard Plain (Figure 13). In 1989, the U.S. Geological Survey initiated their Regional Aquifer-System Analysis (RASA) study in a cooperative effort with local agencies. As part of this and companion cooperative studies, a series of 14 nested well sites with three or more wells installed at each site, were drilled and completed at specific depths in the Oxnard Plain, Oxnard Plain Forebay, Pleasant Valley, and Las Posas basins (Densmore, 1996). Figure 14 shows the locations of the RASA well sites on the Oxnard Plain.

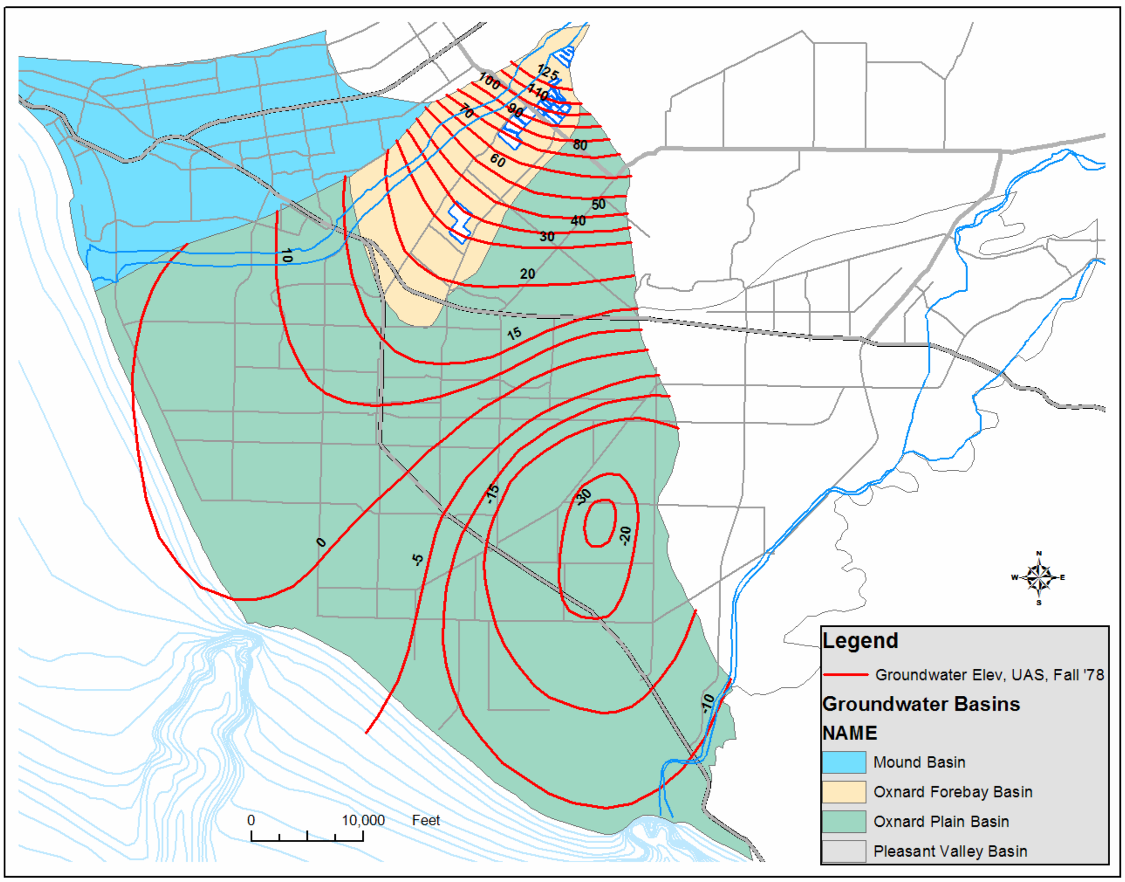

Figure 13. Groundwater elevations in the Upper Aquifer System in Fall 1978, indicating the large pumping trough in the south Oxnard Plain (water levels as much as 30 feet below sea level). This pumping trough, created by overpumping, pulled in seawater from the ocean.

Saline intrusion is recognized in monitoring wells by concentrations of chloride and Total Dissolved Solids (TDS) that are several times higher than the Basin Plan Objectives of 150 mg/L and 1,200 mg/L, respectively. In practice, the leading edge of the intrusion is mapped on the Oxnard Plain as the first occurrence of chloride in excess of 500 mg/L. In some wells that have been intruded, chloride exceeds 10,000 mg/L. The increase in chloride concentration has been rapid in some wells, increasing 1,000s of mg/L in a year or two.

Prior to the RASA study, it was believed an area extending from approximately 3 miles north of Port Hueneme to well SCE (near Highway 1) and south to Point Mugu was intruded by seawater. The installation of a dedicated monitoring network and detailed chemical analysis of water samples from the new wells and other wells yielded new interpretations on the extent of seawater intrusion on the Oxnard Plain. It is now known some areas of the southern Oxnard Plain are not intruded by seawater, but that high chloride readings from older production wells were the result of perched water leaking down failed well casings and contaminating the aquifer (Izbicki, 1992; Izbicki et al., 1995; Izbicki, 1996 a,b). As a partial result of these findings, many of the older wells on the Oxnard Plain have since been destroyed via a cooperative FCGMA-initiated program using Federal 319(h) grant money and matching funds contributed by the City of Oxnard, UWCD, FCGMA, and the County of Ventura. Figure 14 delineates the approximate extent of high-chloride water in the Oxnard aquifer (Upper Aquifer System). Figure 15 delineates the approximate extent of high-chloride water in the Lower Aquifer System.

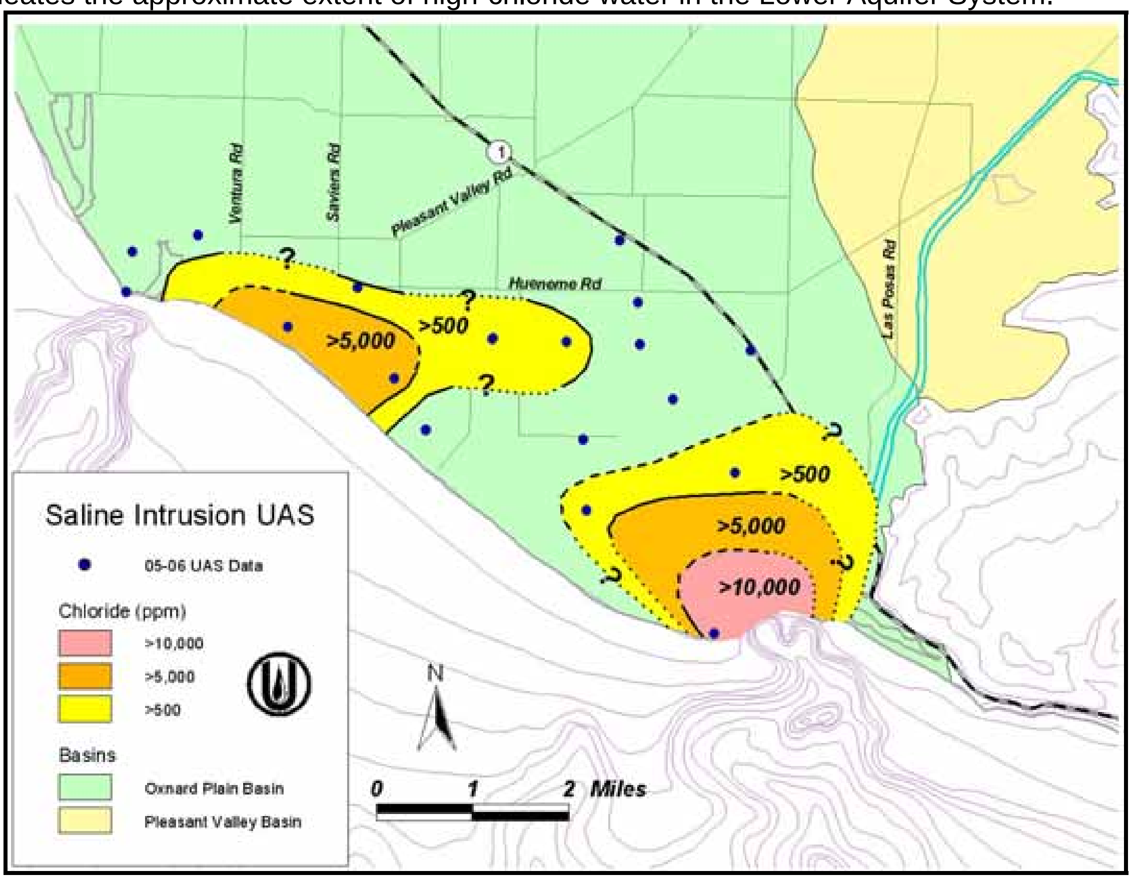

Figure 14. Areas of saline intrusion in the Upper Aquifer System of the Oxnard Plain in 2005-06. Contours of chloride concentrations indicate the maximum extent of the UAS saline intrusion – individual aquifers within the UAS may be less intruded. Contour lines are dashed where inferred and queried where uncertain. Bathymetric contour lines indicate the offshore submarine canyons where the aquifers are eroded along the canyon walls and exposed to seawater.

In addition to drilling and installing the nested monitoring wells, the USGS conducted geophysical surveys to determine the general extent of the high-saline areas (Stamos et al., 1992; Zohdy et al., 1993). This work indicated high-saline areas consisted of two distinct lobes, with relatively fresh water separating the lobes (Izbicki, 1996a). The lobes identified by the USGS form the basis of the areas of high chloride concentration shown on UWCD maps.

Additional down-hole conductivity surveys by the USGS indicate the edges of the lobes are relatively distinct, with the first saline intrusion occurring in thin individual beds of permeable sand and gravel. As intrusion continues, more individual beds or geologic layers are impacted, resulting in increasing chloride levels within the affected aquifer. Thus, the interpretation of high-chloride areas shown on the maps combine measured concentrations from the monitoring wells, geophysical measurements, and study results about the nature of the intrusion front.

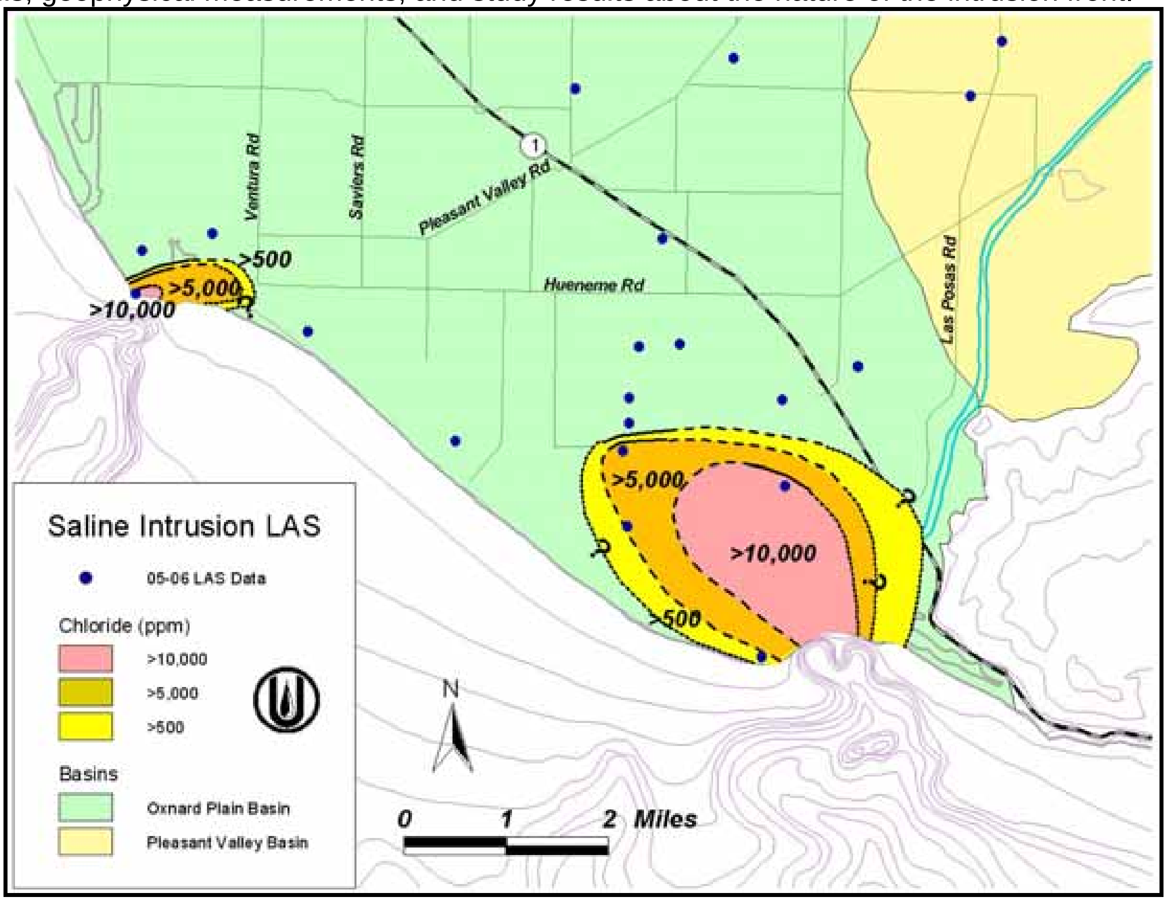

Figure 15. Areas of saline intrusion in the Lower Aquifer System of the Oxnard Plain in 2005-06. Contours of chloride concentrations indicate the maximum extent of the LAS saline intrusion – individual aquifers within the LAS may be less intruded. Contour lines are dashed where inferred and queried where uncertain. Bathymetric contour lines indicate the offshore submarine canyons where the aquifers are eroded along the canyon walls and exposed to seawater.

In addition to monitoring wells and geophysical measurements, isotope studies of groundwater samples from the nested wells indicate that the cause of the elevated chloride levels varies in the Oxnard Plain basin (Izbicki, 1991, 1992). Four major types of chloride degradation were documented:

Lateral Seawater Intrusion - the inland movement of seawater adjacent to the Hueneme and Mugu submarine canyons.

Cross Contamination - the introduction of poor-quality water into the fresh water supply via existing well bores improperly constructed or improperly destroyed, or via corroded casings caused by poor-quality water in the Semi-Perched zone.

Salt-Laden Marine Clays - the dewatering of marine clays, interbedded within the sand and gravel-rich aquifers and containing salts from their marine deposition, yields high concentrations of chloride-enriched water. This dewatering is the result of decreased pressure in the aquifers, caused by regional pumping stresses (excessive groundwater withdrawals).

Lateral Movement of Brines from Tertiary-Age Geological Formations - the lateral movement of saline water from older geologic formations caused by uplift along faults. An example is where older Tertiary rocks are in contact with younger aquifers across a buried fault face near Pt. Mugu.

5.1.2 Saline Intrusion from Surrounding Sediments

A significant portion of the salinity in the aquifers of the Oxnard Plain basin is coming from salts (primarily chloride) pulled from the surrounding sediments, as discussed in the previous section. When this saline intrusion occurs near the coastline, it largely resembles seawater intrusion in concentration and movement in the aquifer, and mitigation measures are similar to those for seawater intrusion (i.e., raising groundwater levels). In more inland areas such as the Pleasant Valley basin, chloride concentrations are generally less, with only a few wells showing any increase in chloride. It is too early to know whether chloride concentrations in the Pleasant Valley basin will escalate to a problem affecting local pumpers.

5.1.3 High Salinity Associated with High Groundwater Levels

Increased salt concentrations (chloride, sulfate, sodium) in aquifers underlying the Arroyo Las Posas in the East Las Posas, South Las Posas, and northern Pleasant Valley basins correspond in time with rising groundwater levels along the arroyo. This rise in groundwater levels has been created by increased recharge as natural streamflow was augmented by the addition of the upstream discharge of treated wastewater and aquifer dewatering projects along the arroyo. The shallow groundwater levels, which are higher than any historic levels, apparently leach salts from the previously unsaturated portions of the aquifer. The problem caused by high groundwater levels in the shallow aquifer has migrated down Arroyo Las Posas across the Las Posas basin and into the northern part of the Pleasant Valley basin, where water levels have risen and salts have increased. Solutions to this salinity problem will likely be based on removing and treating the high-salinity water.

5.1.4 Nitrate in Groundwater

High nitrates in groundwater primarily affect the Oxnard Plain Forebay and Santa Rosa basins. Nitrate is a primary drinking water standard (45 mg/L as NO3), so high nitrate concentrations directly affect the potable water supply. Nitrate is largely introduced into groundwater by man's activities in overlying recharge areas where the nitrate travels directly into the aquifers. Nitrate concentrations typically are a balance between nitrate input and the amount of recharge water available for dilution. Nitrate concentrations commonly increase during dry periods when there is less recharge water for dilution. In groundwater away from recharge areas, nitrates have generally been diluted and are at concentrations well below drinking water standards. An exception to this occurred in the 1990s, when nitrate occurred in City of Oxnard wells in the Oxnard Plain basin, just outside of the Forebay basin. This nitrate may have migrated downward from the Semi-Perched zone through improperly abandoned private wells.

The primary sources of nitrate are septic systems (especially if they are poorly maintained or being used above design capacity) and agricultural fertilizer. These are both being addressed.

As discussed below, septic systems have been prohibited in the Oxnard Plain Forebay basin. In addition, agricultural nitrate, contributed largely from fertilizers, will be monitored in 2006 as part of the Agricultural Irrigated Lands Conditional Waiver program adopted by the Los Angeles Regional Water Quality Control Board. If nitrates are shown to be entering groundwater from agricultural fertilizers through the monitoring program, the waiver requires the implementation of Best Management Practices.

5.2 WATER QUALITY ISSUES BY BASIN

5.2.1 Oxnard Plain Forebay Basin

The primary water quality concern in the Oxnard Plain Forebay basin is nitrate concentrations above the Department of Health Services' Maximum Contaminant Level. Nitrate concentrations in the Upper Aquifer System spike in the Forebay basin during dry periods when there is reduced recharge to the basin. Nitrate concentrations periodically exceed the primary drinking water standard of 45 mg/L (as NO3) in individual wells (Figure 16). Because much of the pumping in the Forebay delivers potable water through the Oxnard-Hueneme (O-H) pipeline (a potable water delivery line that provides groundwater to the cities of Oxnard and Port Hueneme), the drinking water standard is of prime importance. The O-H system has been able to deliver potable water by blending lower-nitrate water and by temporarily shutting down impacted high-nitrate wells.

These nitrates have been attributed to both agricultural activities (fertilizer application) and adjacent septic systems (leach-line effluent discharges). The nitrate problem will continue to be a water quality issue for drinking water wells as long as the sources of nitrate continue to contribute this mineral salt into the groundwater resources. As a result of the high nitrate concentrations, the Regional Water Quality Control Board enacted in 1999 a prohibition on septic systems in portions of the Forebay, with orders that most such disposal systems be eliminated from the Oxnard Plain Forebay basin before 2008. Since that time, disconnecting the nearby El Rio septic tanks and connecting to a sanitary sewer system has been a high priority water quality improvement project for the County.

5.2.2 Oxnard Plain Basin

The significant water quality issue in the Oxnard Plain basin is saline intrusion from both seawater and from surrounding marine sediments. Chloride degradation is directly related to groundwater levels in the basin. The water balance of the Oxnard Plain and the offshore component of the aquifer units is a dynamic balance between groundwater recharge, groundwater extraction, and change in aquifer storage. High groundwater levels in the recharge zone in the Oxnard Plain Forebay basin exert a positive pressure on the confined aquifers of the Oxnard Plain, and water flows from the recharge areas toward the coast (Figure 17). Whereas the pressure exerted by high water levels in the Forebay propagates rapidly through the aquifers, the actual movement of the water itself is slow, at approximately 3 feet per day or less in the Forebay (Izbicki et al, 1992). The pressure (piezometric) surface of the confined aquifer is diminished by the extraction of water from the system. If pressure heads at the coast fall below sea level, the lateral intrusion of seawater will occur. The dewatering of marine clays can occur if heads in the surrounding sediments remain below their historic levels for prolonged periods.

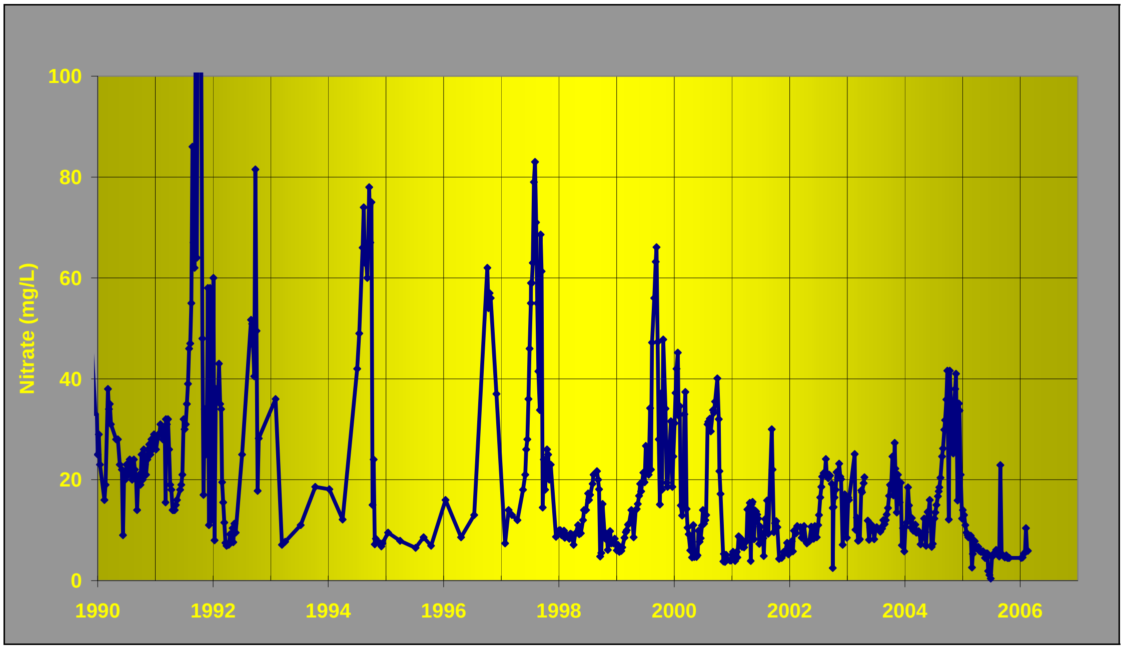

Figure 16. Nitrate concentrations (as NO3) in Oxnard-Hueneme El Rio well #5. Note that nitrate increases during dry portion of year, when nitrate input from overlying land uses is less diluted by low-nitrate recharge water. When nitrate levels are high, this well is either not used or the produced groundwater is diluted with low-nitrate water from other wells in the system.

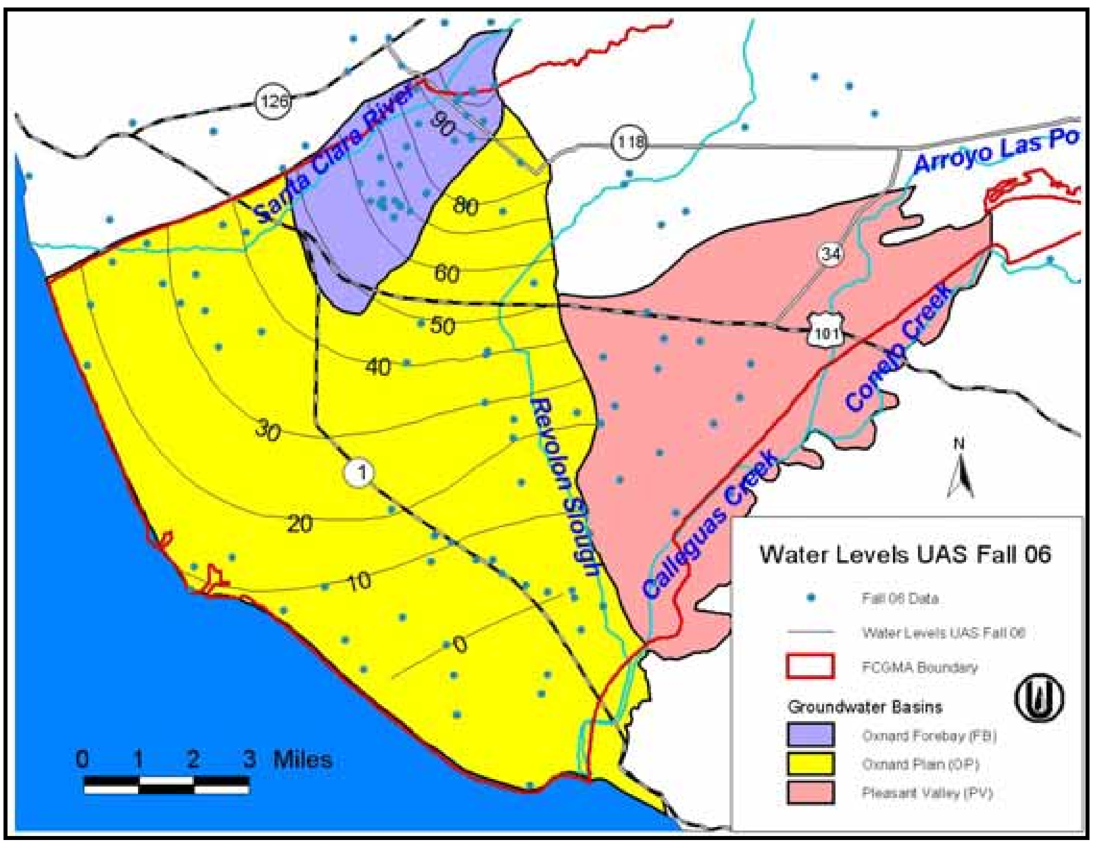

Figure 17. Groundwater elevation contours in the Upper Aquifer System, Fall 2006. Note that southeastern portion of Oxnard Plain remains below sea level (line labeled "zero") and is susceptible to continued seawater intrusion.

Chloride levels in coastal monitoring wells in the Upper Aquifer System show a direct relationship to groundwater levels – with groundwater levels below sea level, chloride levels increased in the early 1990s (e.g., well A1 in Figure 18). However, as the Freeman Diversion on the Santa Clara River began operation in 1991 and a series of wet years followed, the amount of recharge to the former pumping trough area and to the Port Hueneme area increased significantly. This has resulted in a rise in groundwater elevations on the Oxnard Plain and drastic reduction in seawater in some coastal monitoring wells (e.g., well A1 in Figure 18). In fact, the significantly intruded well A1 has returned to its pre-intrusion water quality levels and is currently (2006) within drinking water standards. This may be the first documented instance of such a reversal of seawater intrusion in a coastal basin.

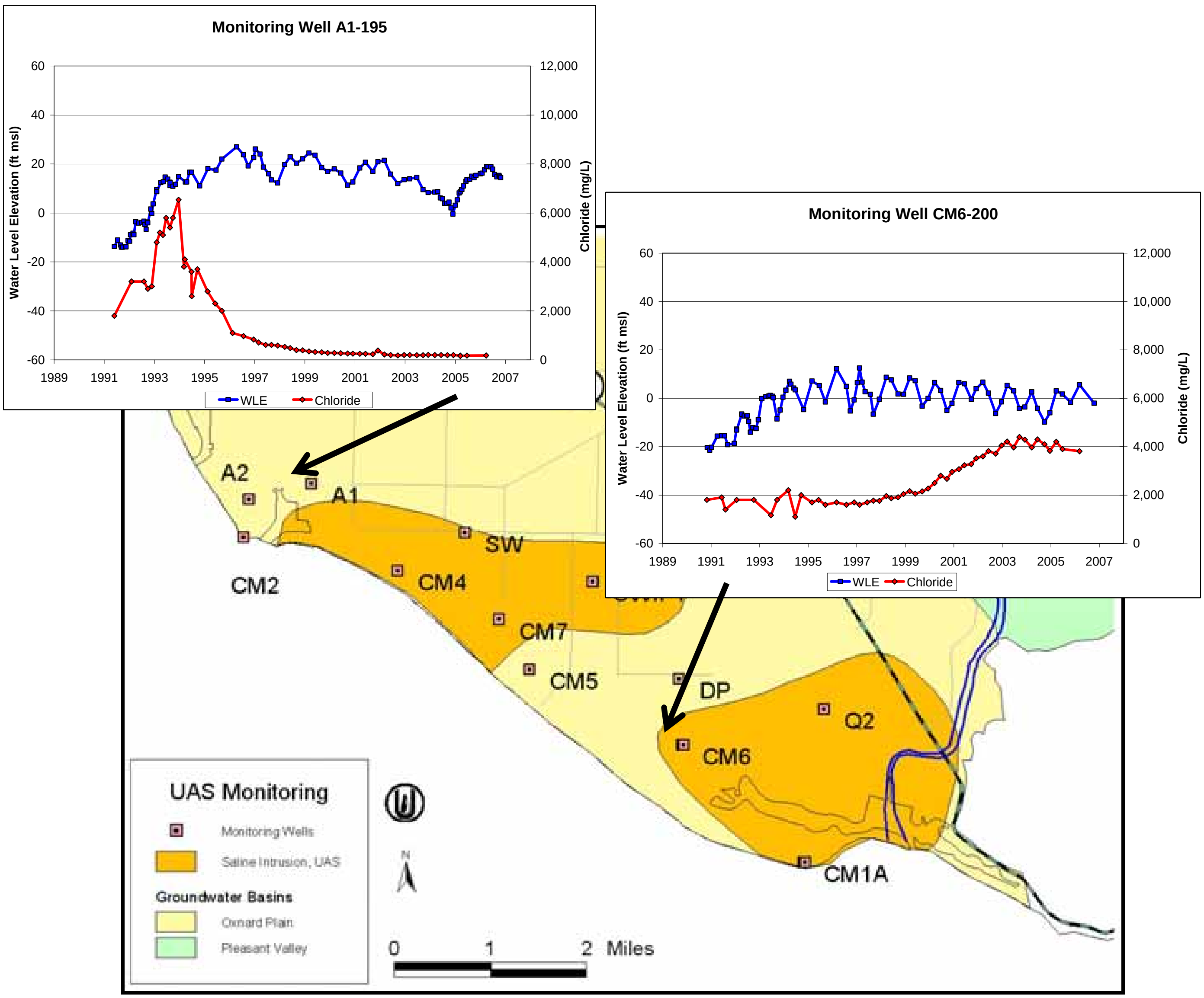

Figure 18. Chloride levels in two Upper Aquifer System coastal monitoring wells. Note that chloride levels have improved to drinking water quality in the A1 well (Port Hueneme lobe), whereas chloride levels continue to increase in the Point Mugu lobe. Uncertainties in exact configuration of saline lobes are indicated in Figure 14.

Despite some encouraging gains, however, the Upper Aquifer System is not completely restored. Although high recharge rates related to the increased flows from the Freeman Diversion have improved water levels and water quality south to Port Hueneme and the higher water levels appear to have eliminated the pumping trough, groundwater levels are still at or below sea level (Figure 17) and water quality continues to degrade in the southern portion of the Oxnard Plain near Point Mugu (e.g., well CM6 in Figure 18). It is likely that the pumping trough situation is similar to the one discussed next for the Lower Aquifer System – namely, that this portion of the Upper Aquifer System may be too far from the recharge areas for direct recharge to be effective, and must rely on artificial or in-lieu (surface water delivered and used in-lieu of pumping groundwater) recharge methods to transport replacement water from the Oxnard Plain Forebay basin or other sources of supply. Groundwater levels in the Lower Aquifer System in the south and southeast Oxnard Plain and central and southern portions of the Pleasant Valley areas have been consistently below sea level since at least the early 1950s (Mann, 1959)(Figure 19). The strategy to switch pumping from the Upper Aquifer to the Lower Aquifer has apparently been at least a portion of the cause for the low water levels and high chlorides that were encountered when the RASA monitoring wells were completed at LAS depths. These high chloride levels occur in several wells at the position of the two Upper Aquifer System seawater lobes (Figure 20).

U.S. Geological Survey studies indicated that the chloride in the LAS occurred not just from seawater intrusion, but also from slow dewatering of the surrounding volcanics and older sediments, as well as chloride-rich marine clays that serve as the aquitard between the Upper and Lower aquifer zones. After the U.S. Geological Survey findings became known and there was the realization the shift in pumping was actually mining LAS groundwater, the County of Ventura took action to change the County Well Ordinance (May 1999) so that only replacement wells or special situations would be allowed to draw water from the LAS; new wells would have to be drilled in the UAS.

The decline in Lower Aquifer System water levels from the late 1980s into the 2000s exacerbated a pumping trough extending from the coastline northeastward to the city of Camarillo (Figure 19). This trough is typically well below sea level, with the deepest portion as much as 180 feet below sea level during the drought of the late 1980s and early 1990s. Despite above-average rainfall in many of the preceding ten years, this pumping trough was still as much as 100 feet below sea level in the fall of 2006 (Figure 19).

Although FCGMA policies and new UWCD recharge facilities built over the last 20 years have significantly improved conditions in the Upper Aquifer System, the Lower Aquifer System continues to experience intrusion by saline waters. This saline intrusion comes both from seawater entering the aquifers along the coastline and from saline waters intruded from surrounding sediments. Any solution to this saline intrusion must include raising water levels in the Lower Aquifer System while concurrently keeping water levels in the Upper Aquifer System at their current elevations. One of the biggest groundwater challenges is to provide either additional recharge or an alternative source of water to the south Oxnard Plain and Pleasant Valley to prevent further water quality degradation in the Lower Aquifer System.

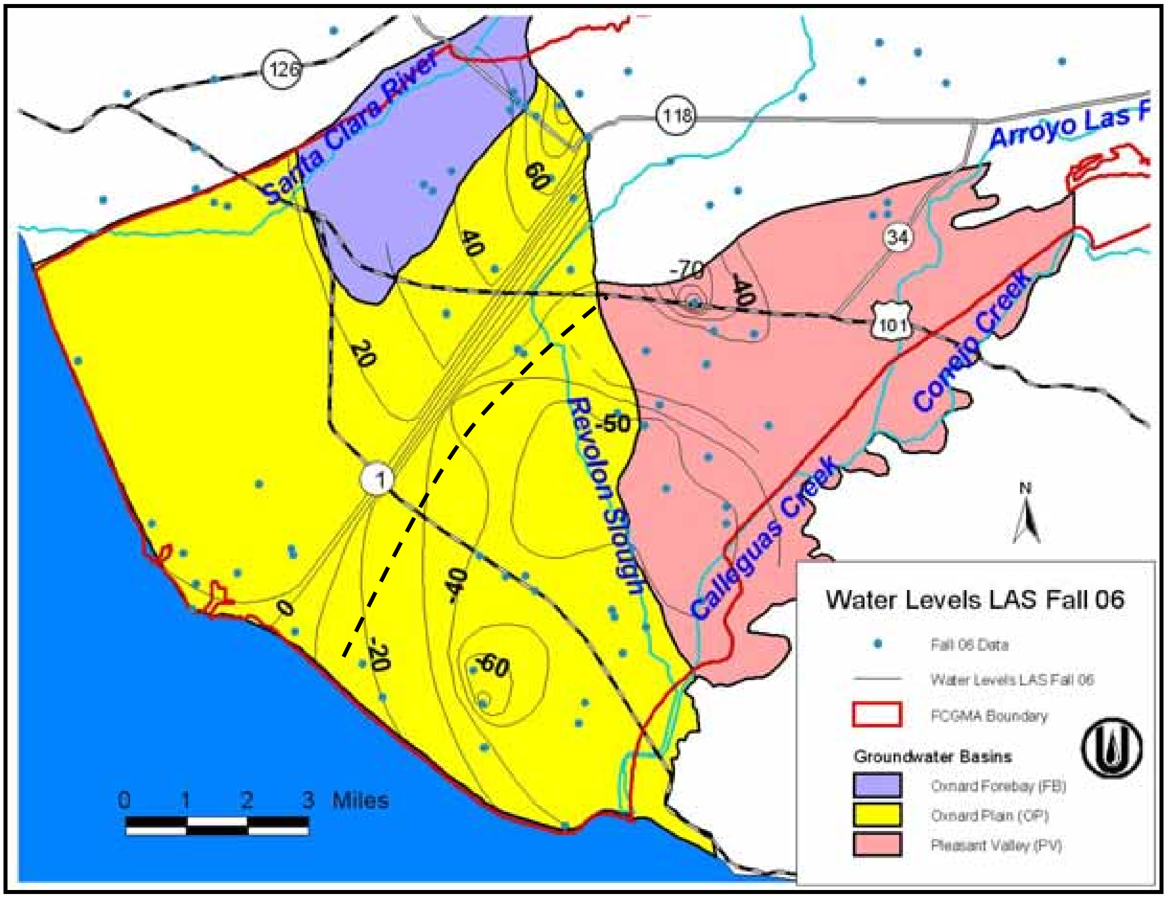

Figure 19. Groundwater elevation contours in the Lower Aquifer System, Fall 2006. Note the distinct series of troughs that extend from the ocean in the south Oxnard Plain northeastward toward Camarillo. These troughs are entirely below sea level. The dashed line indicates the approximate trend of the steep groundwater flow gradients that separate the recharge area in the Forebay from the south Oxnard Plain and Pleasant Valley pumping trough.

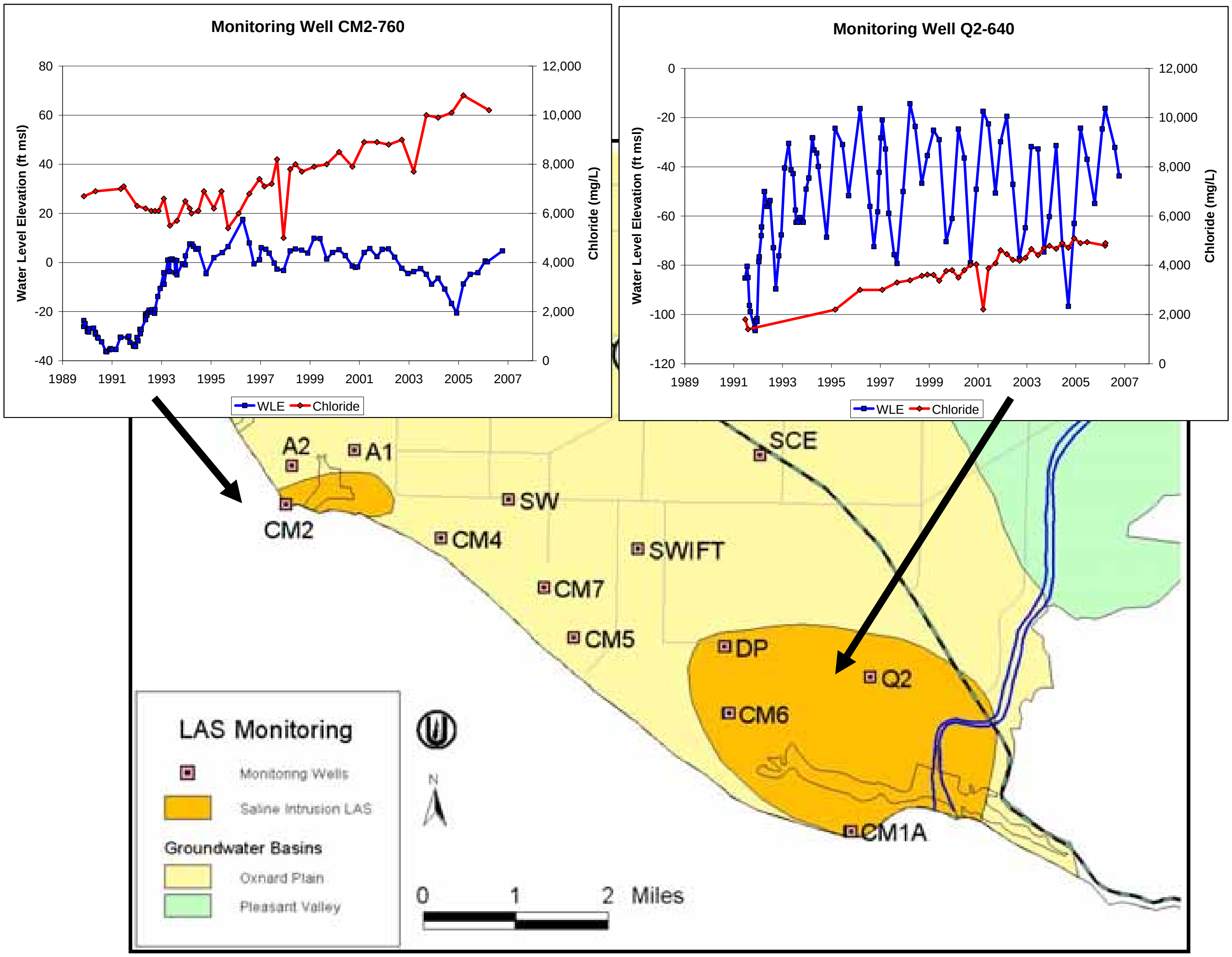

Figure 20. Chloride levels in two Lower Aquifer System coastal monitoring wells. Chloride levels continue to rise in the Point Mugu lobe, requiring new monitoring wells to be drilled inland of current wells to determine the extent of landward movement of high-chloride groundwater. Uncertainties in exact configuration of saline lobes are indicated in Figure 15.

5.2.3 Pleasant Valley Basin

Saline intrusion from surrounding sediments and salinity associated with high groundwater levels are the primary water quality concern in the Pleasant Valley basin. The potential for saline intrusion exists in the depressed groundwater elevations in the Lower Aquifer System of the Pleasant Valley basin (see previous section for discussion of these depressed groundwater levels). The area of depressed groundwater elevations extends from the City of Camarillo to the ocean (Figure 19). Chloride levels within the Pleasant Valley basin are generally less than 150 mg/L, but several wells have shown an increase in chloride. City of Camarillo wells near the Camarillo airport have been affected by the rising chlorides, with one well taken out of service. Increasing chlorides in other wells in the Pleasant Valley basin have recently been shown to have the geochemical signature of "oil-field production water" that underlies the fresh-water bearing aquifers in the basin (Izbicki et al., 2005). This poor-quality water likely was pulled up along fault zones or other conduits towards the lower pressures of the LAS aquifer that were created by overpumping of the basin.

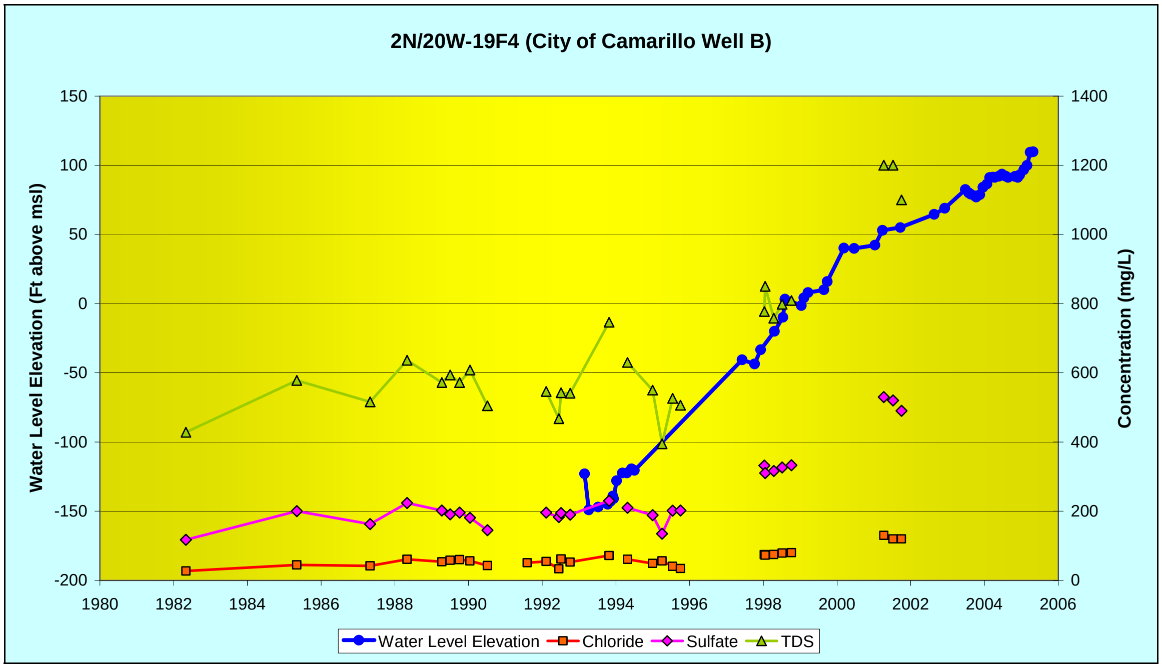

Figure 21. Salts increasing with groundwater elevations, northern Pleasant Valley basin.

Where Arroyo Las Posas crosses into the Pleasant Valley basin in the northern area of the City of Camarillo, the increased flows in the arroyo have raised groundwater levels in the area to historic highs (Figure 21). Coincident with this, water quality has degraded, especially for the constituents sulfate, chloride (Figure 21), iron, and manganese. As in the South Las Posas basin, this higher-salinity water will need to be treated for potable or irrigation use. The City of Camarillo has evaluated the feasibility of treating this poor-quality water, while reducing pumping in the areas of depressed groundwater levels (discussed in section 9.3 *Development of Brackish Groundwater, Pleasant Valley Basin*).

5.2.4 Santa Rosa Basin

The Santa Rosa basin has had long periods where nitrates in some areas were well above drinking water standards (as high as 200 mg/L). Chloride concentrations in the basin are generally between 100 and 150 mg/L, although they have spike locally above 200 mg/L. High chloride concentrations can affect crop production.

5.2.5 West Las Posas Basin

The water quality of the West Las Posas basin currently meets standards for irrigation and drinking water use. Within the pumping depression in the far eastern portion of the basin, samples from two wells have had increased chloride concentrations since 2004. It is not clear if this is the beginning of a trend or if these chlorides were transported into the basin from the shallow aquifer that is generally located along Arroyo Las Posas in the East Las Posas basin (the wells themselves are not along the arroyo).

5.2.6 East Las Posas Basin

Increasing concentrations of salts (chloride, sulfate, sodium) in the portion of the basin along the Arroyo Las Posas continue to be a problem in the East Las Posas basin. Chloride concentrations in the shallow aquifer beneath the arroyo can reach 360 mg/L, whereas chloride concentrations in the surface waters in the arroyo are in the range of 120-180 mg/L (Bachman, 2002). These increased chloride concentrations in the shallow aquifer are associated with historically-high groundwater levels (see discussion in section 5.1.3 *High Salinity Associated with High Groundwater Levels*) that apparently leach salts from previously-unsaturated sediments in the shallow aquifer along the arroyo. The groundwater that contains these chloride-rich salts recharges the Lower Aquifer System by moving downward from the shallow aquifer into the LAS, then northward into the basin. This recharge has formed a chloride-rich recharge mound beneath the Arroyo Las Posas (Figure 22) and northward into the main portion of the East Las Posas basin (Bachman, 2002). Individual wells along the south flank of the basin show a progression of filling of the shallow aquifer, with a coincident increase in chloride concentration (Figure 23). The following section on the South Las Posas basin discusses the age progression of this filling.

5.2.7 South Las Posas Basin

Water quality in the South Las Posas basin is dominated by the movement of salts discussed in the previous section. The filling of the shallow aquifer of the South Las Posas basin progressed from the upstream to the downstream portions of the basin (
Figure 24). With continuing dissolution of salts in the previously-unsaturated sediments, water quality could improve as the salts are expended. Two wells completed in the shallow aquifer beneath the arroyo that have had elevated salts for 20 years have shown a lessening of salinity in the past two years. It is not yet clear if these wells may be a precursor of further salt reduction as salts in the sediments are dissolved and the shallow aquifer begins to reflect the chemistry of surface water in the arroyo (which is higher in chlorides than pre-development conditions, but lower than the groundwater with dissolved salt).

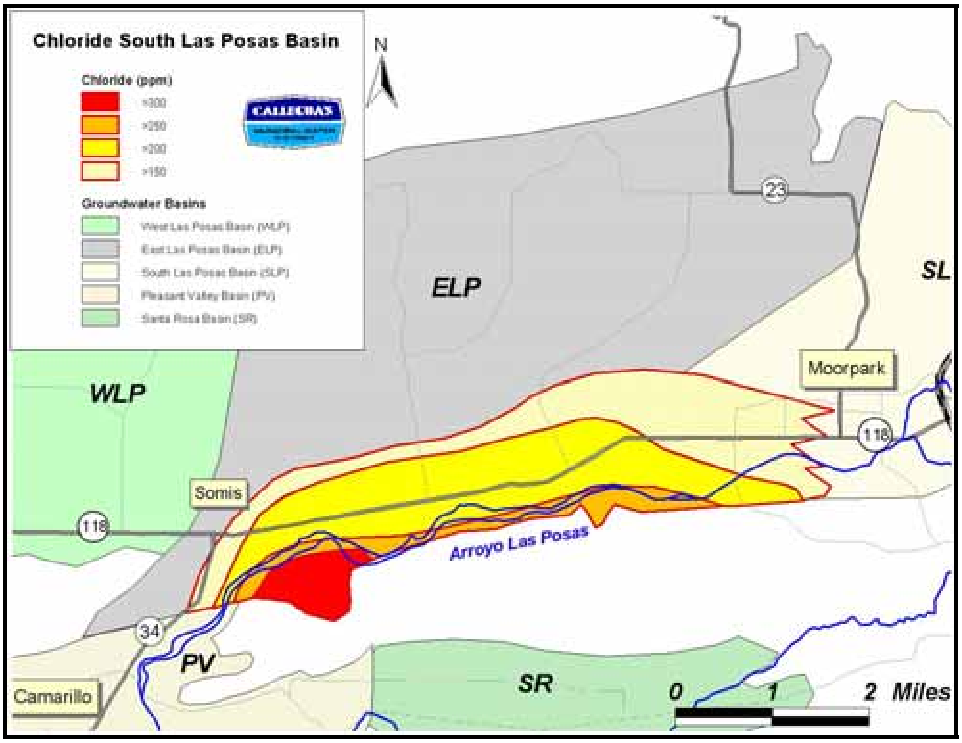

Figure 22. Chloride concentrations (2005-06) in aquifers beneath the Arroyo Las Posas in the East and South Las Posas basins. These concentrations have increased during the last two decades as the shallow aquifer beneath the arroyo has filled to its spill point, caused by increased flow in the arroyo from discharges from dewatering wells and wastewater treatment plants. (Bachman, 2002).

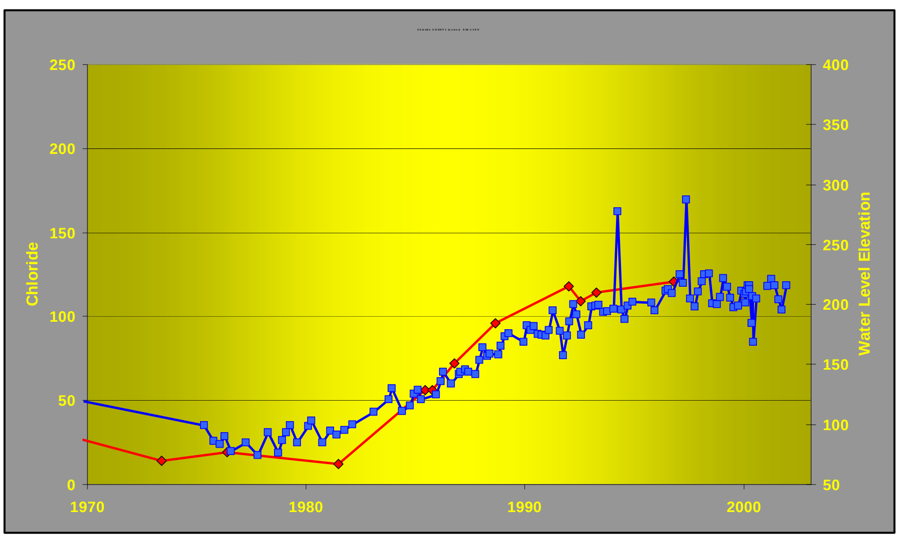

Figure 23. Coincidence of groundwater level rise (blue line with squares) and chloride concentrations (red line with diamonds) in a well in the shallow aquifer along Arroyo Las Posas (Bachman, 2002).

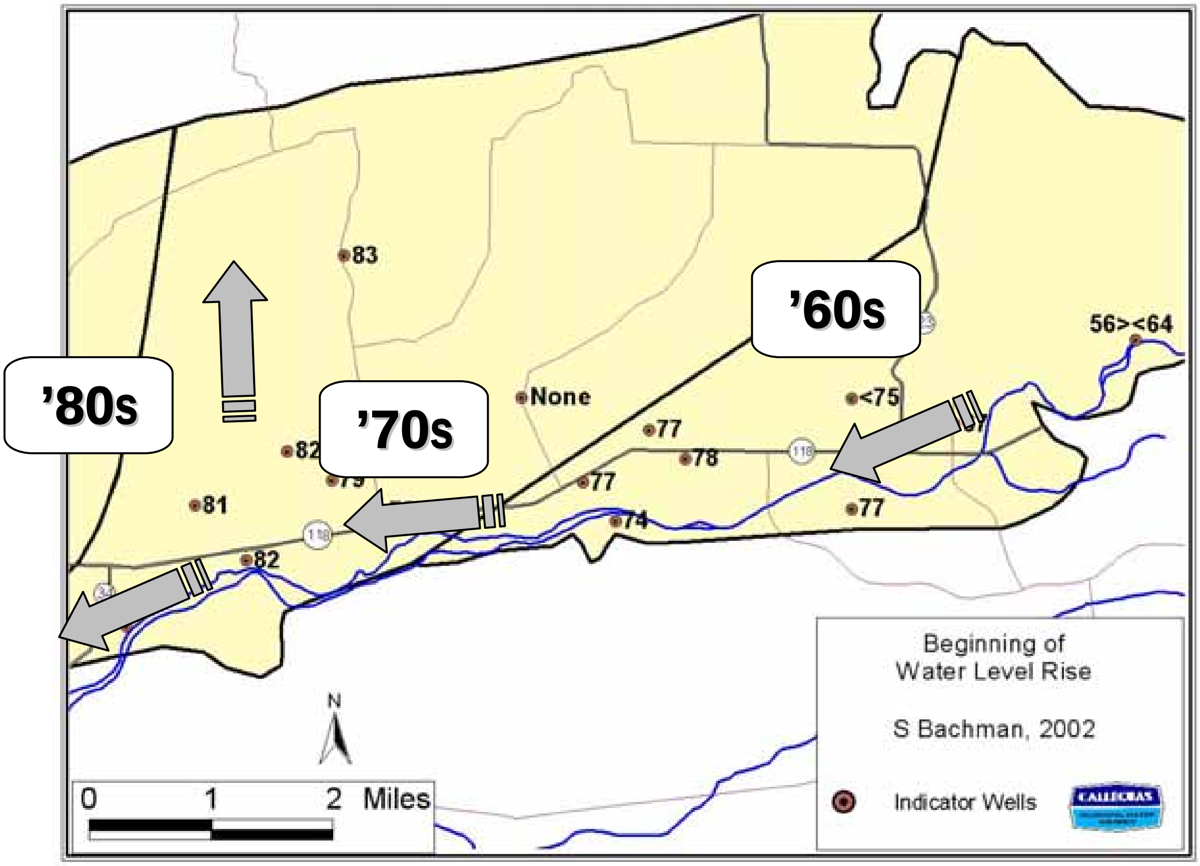

Figure 24. Beginning time of the progressive filling of the shallow aquifer along the Arroyo Las Posas in the South and East Las Posas basins. The number next to each well is the year when groundwater levels started to rise during the filling episode.

5.3 POTENTIAL FUTURE WATER QUALITY THREATS

An area of concern, discussed in the previous section, is potential water quality problems in the Pleasant Valley basin. With groundwater elevations as low as 160 feet below sea level, there exists the potential to pull significant amounts of lower-quality water from surrounding sediments, across or along faults, and from deeper depths (high salinity and/or petroleum-tainted water). Mitigation of these low water levels is important to avoid future water quality problems.

In the northern portion of the Pleasant Valley basin, within the City of Camarillo, increasing chloride concentrations could migrate into the main portion of the basin. However, the details of the hydrogeologic connections from the shallow aquifer to the Lower Aquifer System are still somewhat unclear. Likewise, salt-laden groundwater in proximity to California State University Channel Islands could also migrate from the shallow aquifers to deeper aquifers. This connection is also not well known and the mechanics of transport have yet to be adequately determined, although water level and quality monitoring from wells in the vicinity of the university suggests that the water quality in Lower Aquifer System wells is not affected by poor-quality water in the shallow aquifers. This suggests some barrier to vertical flow between the aquifers in this area.

There are also several other potential water quality concerns within the FCGMA basins. There is a number of leaking underground tanks, some of which have polluted the main aquifers in the basins. Past contamination has been localized and has been addressed through various clean-up operations mandated by the Los Angeles Regional Water Quality Control Board and the Ventura County Environmental Health Department. Water purveyors have become directly involved to ensure rapid cleanup operations in some areas. The FCGMA has lent it support to some of these efforts by water purveyors. There are also possibilities of more-widespread contamination by plumes of such contaminants as perchlorate. Large releases of perchlorate have occurred in the Santa Susana Mountains adjacent to Simi Valley and along the Santa Clara River in Santa Clarita (Los Angeles County). The FCGMA may have to be proactive in the future in ensuring that these and other potential sources do not adversely affect the FCGMA aquifers.

A matter of future water quality concern is the maintenance of current recharge projects that positively affect the Oxnard Plain. Environmental issues in the Santa Clara River and its tributary Piru Creek have the potential for reducing useable water resources – the amount of water available from stored water in Lake Piru and river water at the Freeman Diversion. Since these projects play an integral role in the current FCGMA water management strategies, any loss of yield from these projects would likely reduce some of the gains used in mitigating saline intrusion within the Oxnard Plain.

6.0 BASIN MANAGEMENT OBJECTIVES

6.1 CURRENT OBJECTIVES

Basin Management Objectives (BMOs) are quantitative targets established in a groundwater basin to measure and evaluate the health of the basin. For groundwater basins with seawater intrusion, a critical BMO is maintaining groundwater levels along the coastline to prevent the further intrusion of seawater. In addition, another BMO would be to maintain low concentrations, to the extent possible, of chloride at critical coastal monitoring wells. In inland areas, a BMO would be to ensure groundwater levels prevent conditions that cause groundwater quality degradation. A concurrent BMO would be to maintain concentrations of deleterious chemical constituents in groundwater, such as nitrate and chloride, at or below levels that are harmful to human or animal health or damaging to irrigated crops. Within the FCGMA, several BMOs are appropriate to measure and evaluate the health of the basins. Wells used as monitoring points for the Basin Management Objectives are shown in Figure 25 and described in the following paragraphs.

As part of the BMO attainment process, additional wells may be added to the monitoring process to provide early indications of improving or degrading aquifer conditions at critical locations. An example of such location would be at the north end of the Pleasant Valley Basin where poor quality water from the Las Posas Basin is apparently beginning to enter the Pleasant Valley Basin. This will be an iterative process that will allow the FCGMA to monitor both the current conditions and the relative success of basin management strategies implemented to control water quality in these areas.

6.1.1 Oxnard Plain Basin

The BMO most critical for coastal areas of the FCGMA is the maintenance of groundwater elevations high enough to prevent further seawater intrusion. Because the source of seawater is likely from offshore submarine canyons where the aquifers are truncated and in contact with seawater, coastal aquifers must have groundwater elevations high enough to prevent movement of seawater from the canyons to nearby onshore areas (see discussions in section 5.1.1 *Seawater Intrusion* and section 5.2.2 *Oxnard Plain Basin*). However, seawater is denser than fresh water and the heavier seawater exerts pressure on the fresh water aquifers exposed on the canyon walls – much like water pressure pushes on a diver's mask when the diver descends.

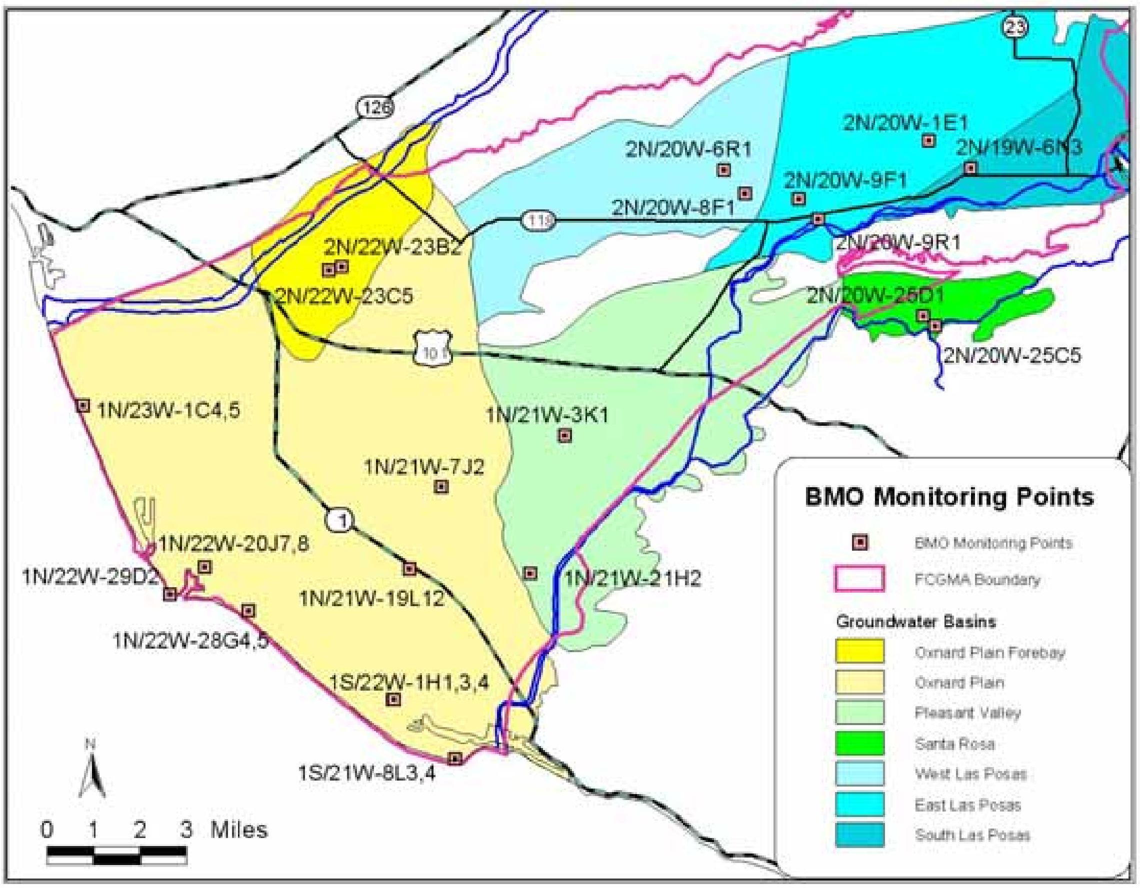

Figure 25. Wells used as monitoring points for Basin Management Objectives.

The pressure differential exerted on the fresh water aquifer depends upon the ocean depth where the aquifer is truncated along the canyon wall – there is the equivalent of 2.5 ft of head (pressure) exerted for every 100 ft of ocean depth. Therefore, an aquifer that is exposed on a submarine canyon wall at 200 ft ocean depth has 5 ft of head exerted on the aquifer by the more-dense seawater. To prevent seawater from intruding from the canyon wall and flowing through the aquifer to the coastline, coastal groundwater elevations must be, on average, at least as high as the head exerted by seawater. Thus, for the example given above, groundwater elevations in monitoring wells at the coastline must average at least 5 ft above sea level to prevent seawater intrusion. The greater ocean depth where the aquifer is exposed to seawater, the higher the average groundwater elevation required to prevent seawater intrusion.

A set of wells was selected to establish the BMOs for the Oxnard Plain basin (Figure 25). Many of these are coastal monitoring wells, completed at different aquifer depths within the Upper (Table 1) and Lower Aquifer Systems (Table 2). There are also several inland wells to detect if a new pumping depression forms in the UAS and if the existing pumping depression in the LAS dissipates. Coastal groundwater elevation objectives were determined using the groundwater elevation and water quality criteria in the preceding paragraph. Inland groundwater elevation objectives were determined such that there is a slight groundwater gradient from the inland areas to the coastline, thereby preventing further landward migration of the existing saline intrusion. The tables list the management objectives for each of the well completions.

The Ventura Regional Groundwater Model suggests that if these groundwater levels are maintained for an adequate period of time, additional saline intrusion will likely be minimized. Water quality objectives for chloride at these wells are also listed in the tables. These objectives follow the Regional Water Quality Control Board's Basin Plan Objective of 150 mg/L for chloride.

Well	BMO Groundwater Level (msl)	Current Level (msl)*	BMO Chloride (mg/L)	Current Chloride (mg/L)
1N/23W-1C5 (CM3-145, 120-145)	Average 3'	9.2'	<150	41
1N/22W-20J8 (A1-195, 155-195)	Average 4'	14.6'	<150	177
1N/22W-20J7 (A1-320, 280-320)	Average 8'	15.5'	<150	81
1N/22W-28G5 (CM4-200, 180-200)	Average 5'	9.0'	<150	237
1N/22W-28G4 (CM4-275, 255-275)	Average 7'	8.4'	<150	6,536
1N/21W-19L12 (SCE-220, 200-220)	Average 5'	11.3'	<150	67
1S/22W-1H4 (CM6-200, 180-200)	Average 5'	1.8'	<150	4,089
1S/22W-1H3 (CM6-330, 310-330)	Average 8'	-12.5'	<150	1,630
1S/21W-8L4 (CM1A-220, 200-220)	Average 5'	-4.9'	<150	16,917

Table 1. Basin Management Objectives for Upper Aquifer System wells in the Oxnard Plain basin. Well name and perforation depths follow State Well Number.

Well	BMO Groundwater Level (msl)	Current Level (msl)*	BMO Chloride (mg/L)	Current Chloride (mg/L)
1N/23W-1C4 (CM3-695, 630-695)	Average 17'	15.4'	<150	36
1N/22W-29D2 (CM2-760, 720-760)	Average 19'	0.2'	<150	9,783
1S/22W-1H1 (CM6-550, 490-550)	Average 13'	-33.3'	<150	3,512
1S/21W-8L3 (CM1A-565, 525-565)	Average 14'	-42.3'	<150	4,161
1N/21W-7J2 (PTP #1, 590-1280)	Average 20'	-52.0'	<150	42

Table 2. Basin Management Objectives for Lower Aquifer System wells in the Oxnard Plain basin. Well name and perforation depths follow State Well Number.

6.1.2 Pleasant Valley Basin

In the Pleasant Valley basin, groundwater elevation objectives were calculated to be slightly higher than coastal objectives to prevent landward migration of existing saline intrusion, and to

* Groundwater levels are average for last 10 years; chemical concentrations are average for last 3 years.

minimize vertical groundwater gradients that pull salts from encasing marine clays, from surrounding older marine and volcanic rocks, or from deeper waters within the oil fields of the basin. An additional BMO is to maintain chloride concentrations at or below the Regional Water Quality Control Board's Basin Plan Objective of 150 mg/L. These objectives are indicated in Table 3.

Well	BMO Groundwater Level (msl)	Current Level (msl)*	BMO Chloride (mg/L)	Current Chloride (mg/L)
1N/21W-3K1 (PV #4, 403-1433)	Average 20'	-47.2'	<150	107
1N/21W-21H2 (PV #10, 503-863)	Average 20'	-51.9'	<150	93

Table 3. Basin Management Objectives in the Pleasant Valley basin. Well name and perforation depths follow State Well Number.

6.1.3 Oxnard Plain Forebay Basin

In the Oxnard Plain Forebay basin, nitrate concentrations above drinking water standards have historically been a recurring problem. BMOs in the Forebay basin focus on protection of public drinking water wells (nitrate and TDS) and irrigation suitability (TDS). The management objectives are chosen for wells in the Oxnard-Hueneme wellfield (operated by UWCD) because this is the largest potable water system in the Forebay. The management objectives will maintain nitrate concentrations at one-half or less of the Maximum Contaminant Level for drinking water (45 mg/L of NO3 which is a primary drinking-water standard); at concentrations higher than the BMO of 22.5 mg/L, water purveyors must increase monitoring and reporting to the California Department of Health Services. The TDS objective is set at the Regional Board's Basin Plan Objective of 1,200 mg/L. These BMOs are set at two representative pumping wells (Figure 25) in the O-H Wellfield (Table 4).

Well	BMO Nitrate (as NO_3) (mg/L)	Current Nitrate (mg/L)*	BMO TDS (mg/L)	Current TDS (mg/L)
2N/22W-23B2 (135-277)	<22.5	13	<1200	1044
2N/22W-23C5 (140-310)	<22.5	8	<1200	1010

Table 4. Basin Management Objectives for the Oxnard Plain Forebay basin. Perforation depths follow State Well Number.

6.1.4 Las Posas Basins

In the South and East Las Posas basins, BMOs cannot be linked directly to observed groundwater levels, because the Calleguas MWD aquifer storage project (in-lieu deliveries and direct injection into the aquifer) creates artificially high groundwater levels that are not indicative of the state of the basin. Instead, the proposed East Las Posas Basin Management Plan (Appendix C) contains a method to use groundwater levels along with a computerized groundwater model to monitor the health of the basins.

The recharge mound that is moving northward from the Arroyo Las Posas (Bachman, 2002) has mobilized salts from the shallow aquifer (primarily located along the Arroyo) vertically downward into the Lower Aquifer System and then north into the main portion of the basin. This

* Groundwater levels are average for last 10 years; chemical concentrations are average for last 3 years.

subsurface movement of groundwater occurs because the head (pressure) in the LAS are lower than in the UAS. Therefore, an appropriate BMO for the East and West Las Posas basins is to maintain a chloride concentration that is suitable for agricultural irrigation use (this concentration is well below the standard for drinking water).

Monitoring points for these BMO chloride concentrations (Figure 25) were selected both in the degraded southern portion of the basin, as well as in areas unaffected by the migrating salts. The East and West Las Posas basins' objective for the chlorides is set at 100 mg/L to protect salt-sensitive crops such as avocados and berries (Table 5). It should be noted that salt concentrations, and especially chloride, are already high within the South Las Posas basin. This chloride is caused by groundwater at historically high elevations apparently dissolving salts from sediments that were historically unsaturated (see section 5.1.3 *High Salinity Associated with High Groundwater Levels*). Specific management strategies to address the South Las Posas basin are discussed later in this Plan. The BMOs for chloride and TDS in the South Las Posas basin are set at the average concentration of the surface water in Arroyo Las Posas, which is the concentration that would likely be attained when salts dissolved from sediments are either removed or have migrated elsewhere, and the groundwater then reflects the chemistry of its primary recharge source.

Well	BMO Chloride (mg/L)	Current Chloride (mg/L)[§]	BMO TDS (mg/L)	Current TDS (mg/L)
2N/20W-9F1 (906-1290)(ELP)	<100	164	<500	1,196
2N/20W-9R1 (456-724)(ELP)	<100	187	<500	1,330
2N/20W-1E1 (567-907)(ELP)	<100	28	<500	638
2N/20W-6R1 (1090-1512)(WLP)	<100	12	<600	520
2N/20W-8F1 (752-1406)(WLP)	<100	34	<600	410
2N/19W-6N3 (101-121)(SLP)	<160	150	<1500	1,500

Table 5. Basin Management Objectives for the Las Posas basins. Perforation depths and basin identifier follow State Well Number.

There are also specific water quality criteria for water injected into the East Las Posas basin as part of the Las Posas Basin ASR project. These criteria are included in a letter from the FCGMA to Calleguas MWD dated July 12, 1994 that approved the project as an injection/extraction facility. These criteria include: sodium absorption ratio 1-4 meq/L, TDS 100-800 mg/L, electrical conductivity not to exceed 1100 uMHO, chloride not to exceed 120 mg/L, boron not to exceed 1 mg/L, and nitrate (presumably as NO3) less than 45 mg/L.

6.1.5 Santa Rosa Basin

Basin Management Objectives for the Santa Rosa basin follow the Regional Board's Basin Plan Objectives (Table 6).

[§] Groundwater levels are average for last 10 years, chemical concentrations are average for last 3 years.

Well	BMO Nitrate (mg/L)	Current Nitrate (mg/L)*	BMO Chloride (mg/L)	Current Chloride (mg/L)
2N/20W-25C5 (Unknown)	<45	116	<150	145
2N/20W-25D1 (UAS)	<45	60	<150	78

Table 6. Basin Management Objectives for the Santa Rosa basin. Aquifer designation (if known) follows State Well Number.

6.2 ASSESSMENT OF BASIN MANAGEMENT OBJECTIVES

The parameters for the proposed Basin Management Objectives (BMOs) are currently monitored on a regular frequency throughout the FCGMA, primarily by the VCWPD and UWCD. Along the coastline of the southern portion of the Oxnard Plain basin, BMOs are being met only in a portion of the Upper Aquifer System (see description and discussion of the Oxnard Plain basin in section 3.0 *Groundwater Basins and Hydrogeology*). Within the Lower Aquifer System, BMOs are significantly different than observed measurements. Groundwater levels are well below sea level both near the coastline and in a wide trough that extends into the Pleasant Valley basin beneath the City of Camarillo.

The Ventura Regional Groundwater Model was used to determine the effectiveness of current and future management strategies in meeting BMOs for groundwater levels. These results are reported under each management strategy and are summarized in Table 8 within the sections on management strategies. The model results were compared to the groundwater level goals set in the BMOs for each strategy that was amenable to evaluation by the model. For instance, strategies that involve shifting the place or amount of recharge and/or pumping can be effectively simulated using the model. Strategies that deal exclusively with water quality, such as reductions in nitrate sources, are not amendable to evaluation using the groundwater flow model.

When current management strategies are applied in the model, BMOs for groundwater levels are met or exceeded in 51% of the quarterly time-steps during the 55-year model period for the Upper Aquifer System (meaning that about half of the time groundwater levels are at or above the BMO values and half the time they are below) and only 5% of the time for the Lower Aquifer System. Successful management strategies are those where groundwater levels meet or exceed the BMOs at least half the time – meeting BMOs all the time is a more conservative approach, but requires much larger and more expensive strategies and does not take into account the natural climatic variations in groundwater levels that occurred even before the basin was pumped extensively. When coastal groundwater elevations are below the BMOs during dry periods, seawater could be pulled into the aquifers, but would then be pushed out during wet periods as groundwater levels rose above the BMOs. This has been the experience in the Upper Aquifer near Port Hueneme, where seawater moved inland and then receded with climatic variations in groundwater elevations below and above the BMOs for that area.

BMOs for LAS groundwater elevations are not being met in the Pleasant Valley basin because of this wide trough of depressed groundwater elevations (see map and discussion in section 3.0 *Groundwater Basins and Hydrogeology*). BMOs for chloride concentrations are not currently being met in all portions of the basin, with chlorides increasing in several wells. A study conducted by UWCD (see following section) indicate some of these chlorides might be pulled from depth with "oil-field production water"** that underlies the fresh-water bearing aquifers in the basin (Izbicki et al, 2005). Chloride concentrations are being carefully monitored in the Pleasant Valley basin.

In the Oxnard Plain Forebay basin, BMOs are being met most of the time. However, nitrate concentrations in individual wells in the Oxnard-Hueneme wellfield have periodically been at or above the drinking water standard during drought. Currently, these high nitrates have been evident only during the driest portions of the year when pumping water elevations were at their maximum depth. Both fertilizers from overlying agriculture operations and numerous individual septic tanks are likely contributors to the recurring high nitrate levels in the Forebay, as discussed in the following section. Nitrate problems continue to plague the Santa Rosa basin as well. The high nitrate concentrations in the Santa Rosa basin are also believed to be caused by excessive fertilizer use and numerous individual septic systems.

Two emerging processes could significantly improve source control of nitrate within the FCGMA. Ventura County is in the process of eliminating hundreds of concentrated leach-line septic systems located in the El Rio area of the southern portion of the Oxnard Plain Forebay basin and the northern Oxnard Plain basin; the homes will be connected instead to the adjacent City of Oxnard wastewater system. In addition, the Conditional Discharge Waiver for Irrigated Lands is being put into effect in 2005-2006 by the Los Angeles Regional Water Quality Control Board. This process, with sub-watershed sampling of runoff from agricultural lands, will likely decrease the loading of nitrates from fertilizer through Best Management Practices and education. By 2010, the required monitoring will likely extend to agricultural waters that are percolating to groundwater, in addition to the current emphasis on surface waters.

In the East Las Posas basin, chloride concentrations are higher than the basin management objective in the two wells closest to the Arroyo Las Posas (wells 9F1 and 9R1, Figure 25). Chloride concentrations as high as 273 mg/L have been detected in these wells. Farther into the main portion of the basin, well 1E1 has chloride concentrations of less than 30 mg/L, well below the BMO. In the West Las Posas basin, chloride concentrations remain below the BMO largely because the fault that separates the West and East Las Posas basins appears to be an effective barrier to groundwater flow and the poor-quality water in the East Las Posas basin does not flow into the western basin. Of concern, however, is the recent transient occurrence of higher chlorides in two wells just to the west of the fault. It is not yet known if this is the beginning of wider-spread degradation or if this is caused by periodic overtopping of the fault by poor quality waters in the shallow aquifer along the Arroyo Las Posas.

7.0 YIELD OF THE GROUNDWATER BASINS

7.1 ORIGINAL FCGMA CALCULATION

The approximate yield of all basins within the FCGMA was calculated for the original management plan as approximately 120,000 AFY. This yield was based on a water budget for the year 1980, with estimates of the water balance for every fifth year to 2010. In the year 2010, there were estimated to be extraction rates 25% higher than recharge rates. This calculation is

** Izbicki compared the isotopic composition of the sampled groundwater with that of water produced with the oil that was pumped from nearby shallow oil wells.

the origin of the 25% pumping reduction required by the FCGMA. The potential inaccuracies in the assumptions that went into the original balance calculation were not discussed in the previous Management Plan, but they are likely to be relatively high (e.g., Bachman et al, 2005). Note that this yield is not basin-specific, which is discussed in more detail below.

7.2 DEFINITION OF BASIN YIELD

The yield of a basin is the average quantity of water that can be extracted from an aquifer or groundwater basin over a period of time without causing undesirable results. Undesirable results include permanently lowered groundwater levels, subsidence, or degradation of water quality in the aquifer. A basin is in overdraft if the amount of water pumped from the basin exceeds the yield of the basin over a period of time. This does not mean that the same amount of water must be pumped each year – pumping in individual years may vary above or below the yield of the basin during drought or wet years, or as part of basin management plans. If water management in the basin changes, the yield of the basin may change.

The term “safe yield” is often used in judicial proceedings for basin yield; it is determined by technical professionals and subsequently interpreted by courts to define the legal rights to extract groundwater in a basin (further discussion in Bachman et al, 2005). Outside of judicial proceedings, terms such as “perennial yield” are commonly used for basin yield. For the purpose of this Management Plan, the term “yield” is synonymous with “perennial yield” which follows the definition in the previous paragraph.

7.3 METHOD OF CALCULATING BASIN YIELD

To evaluate whether falling groundwater levels are likely to cause an undesirable result (i.e., whether the basin is presently in overdraft), a basin’s water levels are evaluated over at least one complete hydrologic cycle to establish a trend. Since hydrologic conditions vary throughout each year and over long periods of time spanning multiple years, conditions must be analyzed over a long period (generally several decades) to accurately determine if the yield has been exceeded such that overdraft is present. If the trend suggests a continual drop in water levels over time, even after wet year conditions, then undesirable results are likely to eventually occur and the basin is considered to be in a state of overdraft.

Methods to determine basin yield include (e.g., Bachman et al, 2005):

- Hydrologic balance,
- Change in groundwater levels over an average hydrologic base period,
- Zero net groundwater level fluctuation,
- The correlation between groundwater levels and extractions,
- Change of storage vs. extractions,
- Calculation of groundwater inflow,
- Groundwater modeling,
- Annual retained inflow and change in groundwater levels,
- Pumping trough in a coastal aquifer (basin yield is exceeded if pumping trough at the ocean creates conditions for seawater intrusion).

The yield calculation for the 1985 FCGMA Management Plan used the hydrologic balance method – summing up all the water inputs and outputs to determine how much could be extracted from the basins. The calculation was not done over a period of wet and dry years, which is the current standard. The basin yield for this Management Plan was calculated using the groundwater modeling method. This method integrates aspects of some of the other methods:

- A hydrologic balance is calculated in the model;
- One of the model outputs is a change in groundwater levels over an average hydrologic base period; and
- A pumping trough in a coastal aquifer is one of the criteria to determine if the basin yield has been exceeded.

The groundwater model technique is more rigorous than the 1985 hydrologic balance calculation because the calculation of a water budget depends upon inputs and outputs (Table 7) to the groundwater basins which can be difficult to estimate independently. The groundwater model also has similar inputs and outputs, but the groundwater model is calibrated to match actual measured groundwater levels over a long period of wet and dry years. This calibration of the groundwater model lessens some of the potential errors in a water budget calculation.

Model Parameter	*Input*	*Output*
Aquifer geometry	Yes	
Recharge, discharge areas	Yes	
Aquifer properties (e.g., transmissivity, storage coefficient)	Yes	
Boundary conditions at edge of model	Yes	
Faults	Yes	
Rainfall percolation	Yes	
Streamflow	Yes	
Recharge from adjacent bedrock	Yes	
Irrigation return flow	Yes	
Artificial recharge	Yes	
Pumping	Yes	
Groundwater elevations	For calibration	Yes
Groundwater flow from one area to another (horizontal & vertical)		Yes

Table 7. Inputs and outputs from groundwater flow model (Ventura Regional Groundwater Model).

The groundwater model used was constructed by the U.S. Geological Survey as part of their RASA study (Hanson et al, 2003), which has since been updated and upgraded by UWCD. The groundwater model is described in more detail in Appendix B. The model was also used to test the efficacy of various management strategies. The base period used for the model runs was 1944 to 1998, which encompasses several wet and dry cycles; this period was also used as a base period in the Santa Paula basin and Santa Maria basin adjudications during the last decade. The base period is only used in the model to simulate the natural hydrology over the 55-year period – modern and future man-made inputs and outputs such as water facilities, pumping, and artificial recharge are added to the model to determine both the current state of the basin and the future state of the basin with new management strategies applied.

There is little doubt that the coastal basins within the FCGMA have exceeded their yield and been in overdraft for several decades. The over-arching undesirable result of lowered groundwater levels has been seawater and other saline intrusion. A key aspect of the modeling was to determine the basin yield such that these undesirable results caused by lowered groundwater levels were eliminated.

Basins within the FCGMA that do not abut the coastline and do not themselves have saline intrusion cannot be evaluated directly for this undesirable result. The 1985 FCGMA Management Plan handled this by treating all the basins of the FCGMA as a common pool – an action in one of the basins would also affect the other basins – so pumping in one basin affects groundwater levels in adjacent basins. There is ample evidence that this proposition continues to be correct, with potentially two exceptions (East and South Las Posas basins). The Oxnard Plain Forebay, Pleasant Valley, West Las Posas, and Santa Rosa basins are all hydrologically connected to the coastal basins, evidenced by the continuity of groundwater elevation contours across their boundaries. The East and South Las Posas basins appear to be hydrologically disconnected within the subsurface from the other basins, separated from adjacent basins by either the north-south fault between the East and West Las Posas basins or a structural discontinuity between the basins and the northern Pleasant Valley basin at LAS depths. Thus, in this Management Plan, the East and South Las Posas basins are combined in determining basin yield and the remaining basins are combined for the same purpose. An example of this combination is the Oxnard Plain Forebay basin – although the basin regularly fills during wet periods, it is so directly connected to the Oxnard Plain basin (there are no hydrologic barriers preventing flow between the basins) that it is not considered separately in determining basin yield.

To determine the yield of the two sets of basins, groundwater levels calculated by the groundwater model for the 55-year forward model period were then compared to the section 6.0 *Basin Management Objectives* in the various basins to determine how close the modeled groundwater levels were to the objective groundwater levels. Because the model simulates conditions over several wet and dry climatic cycles, average modeled groundwater levels were compared to the objectives. The following section summarizes the results of these comparisons.

The basin yield calculation was accomplished in several steps:

1) The groundwater model was run in its 55-year forward model configuration (see Appendix B) with current management strategies included. If modeled groundwater levels were at or higher than Basin Management Objectives for more than half of the time, then undesirable effects such as seawater intrusion were less likely to occur and the basins were considered to be operated within their yield. If not, then the basins were considered to be operating in excess of their yield.

2) Groundwater extractions in the basins were either increased or decreased by stepwise amounts to determine the amount of pumping that would meet the criteria of modeled groundwater levels being at or above BMOs for more than half of the time, but not exceed, BMOs. Extraction were modified in two ways: a) changes were made proportionately to all wells in the basins within the FCGMA, and b) changes were made only in portions of the basins that were tailored to prevent undesirable effects (e.g., extractions were reduced in the south Oxnard Plain and Pleasant Valley only).

3) As an additional calculation, all of the management strategies in this Management Plan were combined in one model scenario to simulate whether Basin Management Objectives can be met when all the strategies were applied – in other words, can these objectives be met with the tools that may be available.

7.4 BASIN YIELD

When current strategies were applied in the Base Case groundwater model run (see Appendix B), groundwater levels in the Upper Aquifer System met or exceeded BMOs 51% of the time and in the Lower Aquifer System 5% of the time. These results are consistent with observed groundwater conditions today, where groundwater levels are close to BMOs in the Upper Aquifer (and seawater is largely being held back) and significantly below BMOs in the Lower Aquifer. Thus, both the model results and observed groundwater levels indicate that the basins within the FCGMA are not being operated within their yield under the current pumping patterns and management strategies – lowered groundwater levels create undesirable effects such as saline intrusion.

To determine basin yield, pumping was then reduced step-wise in the forward model until BMOs were met at least half the time during the model simulation. As indicated above, two methods of pumping reductions were used – GMA-wide and targeted only to the south Oxnard Plain and Pleasant Valley basins. The results of these model runs are shown in Figure 26.

Figure 26 indicates that when progressively greater pumping reductions are applied to all wells within the FCGMA, Lower Aquifer BMOs are attained at least 50% of the time when FCGMA pumping is reduced to about 65,000 AFY – about half of current average pumping. When the reductions are limited to the south Oxnard Plain and Pleasant Valley basins, overall FCGMA pumping is reduced to about 100,000 AFY to attain the same Lower Aquifer BMO goals. Because the significant lowering of groundwater levels has occurred in the south Oxnard Plain and Pleasant Valley areas, it is appropriate that this is where pumping reductions should occur, as they have through historic in-lieu water deliveries. Thus, 100,000 AFY appears to be an appropriate number for basin yield.

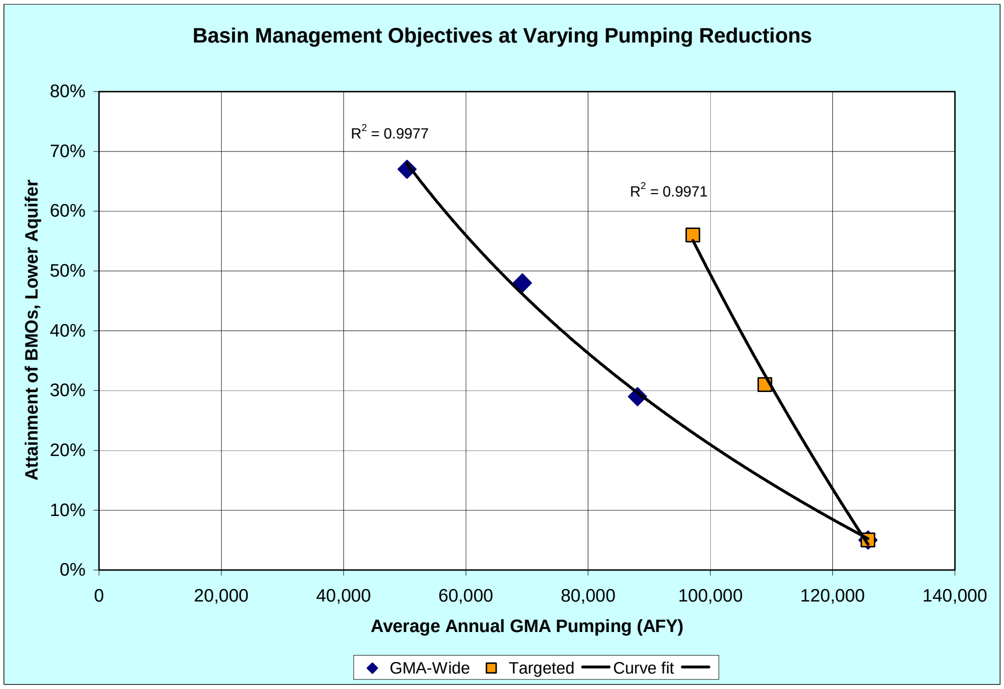

Figure 26. Groundwater model results from progressively reducing FCGMA pumping both agency-wide (diamond symbol) and targeted to the south Oxnard Plain and Pleasant Valley basins (square symbol). Results are indicated as percent of time that BMOs are met or exceeded in the Lower Aquifer System. R^2 values are indicated for the two curve fits.

There are three caveats to this calculation of basin yield:

1) Overall pumping in the south Oxnard Plain and Pleasant Valley areas was reduced by about 25,000 AFY (an 85% reduction). There are several approaches to achieve this reduction, with replacing the pumping with in-lieu deliveries being the primary historic method that is also favored in the management strategies discussed in this Plan.

2) The yield of the basins is not a forever-fixed number, but depends upon the projects in the basin – increasing the amount of recharge in the basins also increases the yield of the basins. Therefore, the yield of the basins must be recalculated periodically as new projects become operational and conjunctive use is increased.

3) When Lower Aquifer BMOs are attained 50% of the time, there should be no net movement of seawater within the aquifers. However, during dry periods there would be onshore gradients and during wet periods there would be offshore gradients. Thus, seawater may move landward during the dry periods and be pushed back during wet periods (which has been evident over the past 15 years at coastal Port Hueneme). To create conditions such that seawater could never move landward, the Lower Aquifer goals would have to be met nearly 100% of the time – an unrealistic goal that would require very large pumping reductions and create conditions where large quantities of fresh water were flowing to the ocean almost all the time. The 50% attainment of BMOs should be considered as an initial target level, but should be revisited as that goal is approached to ensure that it is sufficiently protective of the aquifers. If water quality problems continue as the 50% attainment level is approached, an increase in the attainment level should then be considered. Thus, the basin yield of 100,000 AFY that is tied to the 50% attainment level may have to be adjusted in the future.

An additional basin yield task was to apply all the future management strategies into one simulation of the model to determine whether Basin Management Objectives could be met if these strategies were in place. After applying the management strategies discussed in section 9.0 *Management Strategies Under Development* and section 10.0 *Potential Future Management Strategies*, the groundwater modeling indicates that Upper Aquifer BMOs could be met 67% of the time and Lower Aquifer BMOs could be met 76% of the time. Thus, application of the management strategies in this Plan apparently can solve the overdraft within the FCGMA.

8.0 CURRENT GROUNDWATER MANAGEMENT STRATEGIES

This Plan evaluated three types of management strategies for effectiveness: 1) currently implemented management strategies; 2) strategies under development where some action has already been taken to design and implement those strategies; and 3) potential future management strategies. Current strategies were evaluated by measuring their effect on changing groundwater levels and improving groundwater quality. Proposed and future strategies were evaluated using the Ventura County Regional Groundwater Model (an empirical computer simulation of groundwater flow described in Appendix B).

Several management strategies were adopted as part of the original 1985 FCGMA Management Plan. In addition, several other strategies were also implemented in the ensuing period since 1985. The previously-adopted 1985 FCGMA management strategies are discussed first, followed by the additional strategies. The effectiveness of these management strategies is then evaluated in the following discussion.

8.1 DESCRIPTION OF 1985 FCGMA MANAGEMENT PLAN STRATEGIES

The original 1985 FCGMA Management Plan specified several management strategies that would be implemented. These included the following general strategies.

8.1.1 Limitation of Groundwater Extractions

The most visible of the FCGMA strategies was the phased reduction in pumping within the FCGMA, implemented under FCGMA Ordinance No. 5 (now Chapter 5 within Ordinance No. 8.1). This strategy called for a 25% pumping reduction over a 20-year period via phased 5% incremental cutbacks to Historical Allocations every 5 years. As part of this strategy, pumping allocations, conservation credits, and agricultural irrigation efficiency allowances were implemented. To allow inherent flexibility, the Ordinance provides for Historical Allocation adjustments of no more than two acre feet per acre when land use changes from farming to municipal/industrial. A Baseline Allocation of one acre foot per acre was established for lands without allocations or lands that were developed after the baseline period ended in 1989 and were dependent upon groundwater. In addition, an Efficiency Allocation that allows farmers sufficient allocation to grow different crops as long as they remain at least 80% efficient (less than 20% of irrigation water runs off, leaches, or goes to deep percolation). Baseline and Efficiency allocations are exempt from the mandatory 25% reductions. To discourage overpumping, the FCGMA Ordinance imposes an extraction surcharge on all water pumped in excess of the annual allocation. The penalty initially ranged from $50/AF to $200/AF under a four-tiered system; however, that system was modified in favor of a single flat rate that was adjusted upward to $725/AF.

Ordinance No. 5, now part of Ordinance No. 8.1, also has a provision for establishing Conservation Credits by extracting less groundwater than the Historical Allocation. Conservation Credits can be used to avoid paying penalties when extractions exceed the allocation. A second type of credit, Injection or Storage, may be established and applied to future extractions when foreign water is injected or percolated into the aquifer. Conservation credits are allowed to accumulate with no restrictions, allowing some pumpers to accumulate credits for tens of thousands of acre-feet of water.

The required phased 5% reductions occurred in 1992, 1995, and 2000 for a current reduction of 15% of allocation for pumpers using their Historical Allocation. The planned additional 5% reduction for 2005 has been delayed per a request from M&I well owners who have asked for a re-evaluation of the effectiveness of such reductions as part of formulating this Management Plan.

8.1.2 Encourage Both Wastewater Reclamation and Water Conservation

The Ventura County Planning Department prepared a “Water Conservation Management Plan” which recommended various voluntary measures that could be employed to conserve water. Many farmers, individual households, and cities have adopted voluntary agricultural and urban water conservation programs. For several years, in the late 1980s and early 1990s, the County Planning Department designated Planner positions as “Water Conservation Coordinators.” This program no longer has funding, but the water conservation program created material that continues to be distributed to schools and the public.

A Countywide Wastewater Reuse Study, prepared in 1981, identified wastewater reuse opportunities in the Las Posas Valley from either the Simi Valley Wastewater Treatment Plant or the Moorpark Wastewater Treatment Plant, and identified an opportunity to use recycled wastewater from the Thousand Oaks/Hill Canyon Wastewater Treatment Plant for irrigation on the Oxnard Plain. Since that report, the Moorpark Wastewater Treatment plant has upgraded to tertiary disinfection and a portion of the recycled water is supplied for irrigation to nearby golf courses. The Thousand Oaks/Hill Canyon project (now known as the Conejo Creek Diversion project) has been in operation for several years; it is discussed in the following section. In addition, the City of Oxnard's proposed recycled water project is discussed in section 9.1 GREAT Project (Recycled Water).

8.1.3 Operation of the Oxnard Plain Seawater Intrusion Abatement Project (UWCD's Pumping Trough Pipeline, Lower Aquifer System Wells, Freeman Diversion) –

The Pumping Trough Pipeline (PTP) was constructed in 1986 to convey diverted Santa Clara River water to agricultural pumpers on the Oxnard Plain, thus reducing the amount of groundwater extractions in areas susceptible to seawater intrusion (Figure 27). When river water is not available, five Lower Aquifer System wells pump water into the pipeline. The Freeman Diversion (1991), which replaced the former use of temporary diversion dikes in the Santa Clara River with a permanent concrete structure, now allows for diversion of river storm flows throughout the winter rainy season. As a side benefit, the Freeman Diversion helped stabilize the riverbed after years of degradation caused by in-stream gravel mining. The permanent Freeman Diversion increased the yield of the Seawater Intrusion Control Project by about 6,000 AFY over the previous means of temporary diversion.

8.1.4 Operating Criteria for the Oxnard Plain –

The combination of FCGMA policies and water conservation facilities have effectively moved pumping away from the coastline and from the Upper Aquifer System to the Lower Aquifer System. The switch in aquifer pumping is discussed in the next FCGMA strategy. The effectiveness of these criteria is discussed in section 8.3 Effectiveness To-Date of Current Management Strategies.

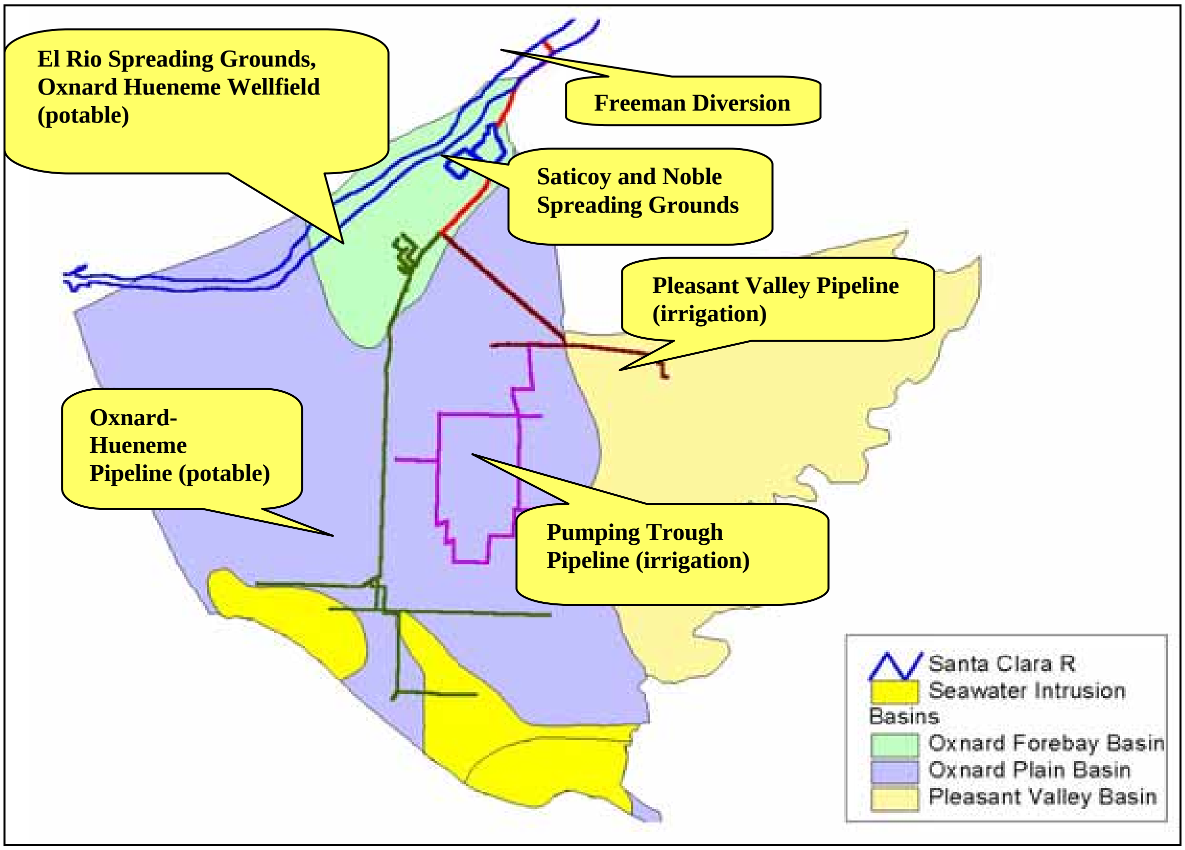

Figure 27. Elements of the Seawater Intrusion Control Project on the Oxnard Plain.

8.1.5 Construction/Modification Restrictions on Upper Aquifer System Water Wells –

In areas where they could cause overdraft or seawater intrusion in the Oxnard Plain basin, the County adopted a well ordinance that prohibited new wells in the Upper Aquifer System in the Oxnard Plain basin, instead requiring new and replacement wells to be drilled in the Lower Aquifer System. The effectiveness of this strategy is discussed in section 8.3 *Effectiveness To-Date of Current Management Strategies*.

This policy has now been shifted. A new policy for areas where pumping could cause overdraft or seawater intrusion in the Oxnard Plain basin (especially in what are called Sealing Zones 1 and 2 where multiple aquifer layers exist) was adopted by the County. This new well ordinance, adopted in 1998, prohibited new wells in the LAS beneath the Oxnard Plain, instead requiring new and replacement wells to be drilled into the more-easily replenished UAS. This shift in pumping was effected by a change in the County Well Ordinance to institute a complete reversal in which aquifers are targeted for production based on findings from the U.S. Geological Survey RASA study and observations from the network of monitoring wells. Since the County Well Ordinance was revised in 1998, only replacement wells or situations with no other water supply option available may tap into the LAS beneath the Oxnard Plain.

8.1.6 Annual Groundwater Monitoring Program

The FCGMA and UWCD participated with the USGS in installing (circa 1990) a series of multiple-completion nested monitoring wells along coastal areas of the Oxnard Plain basin and in a few inland areas. These wells allow measurement of groundwater levels and sampling of water quality at two to six discrete aquifer depths at each well site. These wells, in addition to a wide range of productions wells, are now being monitored at regular intervals by VCWPD and UWCD. The VCWPD findings are entered into a database and published as supporting data in various reports on water quality, groundwater basins, or special subject or area studies. UWCD enters its monitoring data into a database that is then augmented by monitoring data from VCWPD and California Department of Health Services (public supply wells). UWCD conducts an annual evaluation of all the monitoring results in its database and prepares an annual report that is available on UWCD's website (www.unitedwater.org).

8.1.7 Contingency Plan for LAS Seawater Intrusion

Although it was hoped that such a plan would never be needed, the FCGMA staff developed an as-yet-unfinished and informal contingency plan that consists of a list of possible measures that could be instituted to address intrusion of seawater into the LAS. The list items were only to be offered to the FCGMA Board as possible countermeasures in the event of a severe water quality decline in a significant number of LAS wells. This list included suggestions such as managing the intruded basin in a separate management scheme, further reductions in LAS well Historical Allocations, possible groundwater use restrictions by maximum volume per acre served (in the case of irrigated lands or per resident or dwelling unit in the case of urbanized areas), a complete ban on all future LAS wells regardless of need or circumstance, monetary or other potential incentives to encourage LAS well owners to destroy wells in favor of other possible water sources, and other such means of LAS management.

8.1.8 North (now called East and West) Las Posas Basin Pumping Restrictions

The FCGMA adopted Ordinance No. 4 (now Chapter 4 within Ordinance 8) that prohibits expansion of water use outside the Las Posas Basins and/or the Agency boundary, especially on the sensitive Aquifer Outcrop Zone or Expansion Area. The Aquifer Outcrop Zone is that land or geographic area where the Fox Canyon and/or Grimes Canyon aquifers reach the ground surface and are exposed as outcrops. Ordinance 4 restricts or precludes use of any harmful land uses in this zone (such as impervious surfaces, septic systems, pesticides, fertilizers, or groundwater withdrawals), because this area acts as a direct conduit to the usable aquifer water stored at depth. The Expansion Area was defined as that portion of land from the crest of the hill or 1.5 miles beyond the Agency boundary (northernmost extension of the Aquifer Outcrop) that drains into the Agency. Because groundwater quality protection and prevention of volume exports are the prime subjects of these laws, the Expansion Area was officially designated as an official Sphere of Influence zone by the Ventura LAFCO (Local Area Formation Commission). No wells, no additional agriculture, and only very limited single family home development is allowed in these areas, and only under special restrictions and circumstances.

8.1.9 Monitor FCGMA Groundwater Extractions to Ensure That They Do Not Exceed Adopted Projections for That Basin

The FCGMA requires semi-annual reporting of extractions from pumpers within the Agency as part of the measures instituted within Ordinance No. 5 (now Ordinance No. 8). These data are entered into a database maintained by the FCGMA. Individual operator annual extractions are compared against allowed allocations or irrigation efficiency at the end of each calendar year to determine whether well operators are within their allowed pumping. As discussed under the first strategy on limitations of groundwater pumping, penalties are assessed for overpumping, and credits are posted for conservation or storage.

8.1.10 Implementation of Drilling and Pumping Restrictions

This strategy is discussed as part of several of the strategies above and is supported by the County Well Ordinance and the cooperation of water districts and well owners.

8.1.11 Metering of Groundwater Extractions

As part of the original Ordinance No. 5, extractions must be reported to the FCGMA on a semi-annual basis. Ordinance No. 3 (now Chapter 3 within Ordinance No. 8) required water flow meters to be installed at owners' expense on all groundwater pumps except domestic users on one acre or less. Not all pumpers have installed meters or use their meter readings to report extractions. Resolution 2006-1 requires periodic accuracy calibration of every water flow meter by independent testing agents. This Resolution also tightened requirements and imposed restrictions on well extraction reporting in addition to adding more strict penalties for non-compliance.

8.2 DESCRIPTION OF OTHER CURRENT STRATEGIES

There are several other groundwater management strategies that have been implemented within the FCGMA area that were not foreseen when the original management plan was formulated some 20 years ago. These include:

8.2.1 Fox Canyon Outcrop Expansion Area

A buffer zone ("Expansion Area") along the outcrops of the Fox and Grimes Canyon aquifers, which are adjacent to and outside of the FCGMA boundaries, was established in 1997. This zone was established to protect any land uses on the outcrop or within the Agency that might adversely affect groundwater recharge, groundwater extractions, or water quality.

8.2.2 Noble Spreading Basins

The Noble Spreading Basins (1995), across Los Angeles Avenue opposite UWCD's Saticoy Spreading Grounds, were constructed to store and recharge additional Santa Clara River water diverted at the upstream Freeman Diversion, particularly during wet periods. These relatively shallow basins were reclaimed gravel pits purchased by UWCD and reconfigured as water spreading basins. Water placed in the facility recharges both the Upper Aquifer System and the Lower Aquifer System. The ten-year average for the facility is 6,000 AFY, with individual years varying from 0 AF to 17,800 AF.

8.2.3 Las Posas Basin ASR Project

The FCGMA in 1994 approved Calleguas MWD's Las Posas Basin Aquifer Storage and Recovery (ASR) project as an Injection/Storage Facility. This allowed Calleguas MWD to receive Storage Credits for water recharged as part of the project. Conditions of the approval included registration of the injection/extraction wells, monthly reporting of injection/extraction volumes, water quality requirements for injected water, a limit on the amount of water in storage (300,000 AF), required points of extraction, a limitation to use the stored water only within Ventura County, periodic review of injection/extraction effects, and an agreement to halt operations if any conditions are not met. As of 2006, Calleguas MWD has stored over 60,000

AF of water through in-lieu deliveries to basin pumpers and direct injection. Although most extractions have been for testing and maintenance purposes, full-scale extractions occurred during January 2007 to supply customers during a scheduled maintenance shut-down of the supply line bringing State Water to Calleguas MWD.

8.2.4 Conejo Creek Diversion Project

The Conejo Creek Diversion Project (2002), constructed by Camrosa Water District just south of where Highway 101 crosses Conejo Creek, diverts flows from the creek and delivers the water to Pleasant Valley County Water District to meet local irrigation demands within the overdrafted Pleasant Valley basin. The water diverted from the creek is a combination of natural stream flow and recycled water released into the creek from wastewater treatment plants upstream. This diverted water replaces Lower Aquifer System pumping in the Pleasant Valley basin. The contractual amount of water from the diversion is 3,000 AFY (if available), although an average of 5,300 AFY has been diverted in the first four years of operations. These diversions may increase temporarily, but are likely to decrease over the next 20 years as the recycled water is used elsewhere by Camrosa Water District customers.

8.2.5 Supplemental M&I Water Program

The Supplemental M&I Water Program is operated through the Oxnard-Hueneme (O-H) Pipeline system. The joint UWCD-Calleguas MWD project uses FCGMA credits earned by Pleasant Valley County Water District from the Conejo Creek Diversion Project to supplement O-H water supply. This project effectively shifts Lower Aquifer System pumping in the Pleasant Valley basin to Upper Aquifer System pumping in the Oxnard Plain Forebay basin. The program is capped at 4,000 AFY and is only implemented in years when groundwater levels in the Forebay are sufficiently high to prevent harm to other Forebay pumpers. The program effectively reimburses Calleguas MWD for their investments in the Conejo Creek project, a precedent that may allow similar types of projects in the future.

8.2.6 Saticoy Wellfield

The UWCD Saticoy Wellfield (2005) was constructed adjacent to the UWCD Saticoy Spreading Grounds to pump shallow water from the recharge mound underlying the spreading grounds in wet years and deliver the water to users along United’s existing agricultural pipeline system (Pleasant Valley and PTP pipelines). This pumping from the Oxnard Plain Forebay basin decreases the recharge mound, allowing more spreading and groundwater recharge from the basins during wet periods. The water produced by the pumping in the Forebay replaces LAS groundwater pumping along the Pumping Trough Pipeline (PTP) and Pleasant Valley (PV) Pipelines.

8.2.7 Importation of State Water

The County of Ventura holds a State Water allocation of 20,000 AFY administered by the California Department of Water Resources (DWR). This allocation is divided among UWCD, the City of Ventura, Port Hueneme Water Agency (as a sub-allocation of UWCD’s portion), and Casitas MWD. UWCD uses its allocation to supplement recharge to the aquifers along the Santa Clara River within Ventura County. UWCD’s 3,150 AFY allocation (UWCD’s allocation was 5,000 AFY, but the Port Hueneme Water Agency acquired 1,850 AFY of the allocation) is ordered from DWR during normal and dry years for delivery to Lake Piru via stream releases from the DWR-operated Lake Pyramid downstream along Piru Creek. This State Water is then released from Lake Piru as part of UWCD's normal conservation release in the late summer and fall. As this water flows down Piru Creek and the Santa Clara River, a portion of it percolates into the groundwater basins along the river (Piru, Fillmore, and Santa Paula) and a portion reaches the Freeman Diversion for recharge to the Oxnard Plain.

This recharge is not credited by the FCGMA to UWCD directly, but based on many years of study, measurement, and computer modeling, the portion of the DWR purchased water that ultimately reaches the Freeman Diversion is credited as new or foreign water. The credits are placed in a UWCD-held trust fund that may be used in the future to solve common FCGMA management issues that are beneficial to the aquifers within the Agency. The Port Hueneme Water Agency's 1,850 AFY is delivered via Calleguas MWD's conveyance facilities. Except for 2,000 AF imported in 2002, no other portion of the 20,000 AFY entitlement has ever been imported to Ventura County, although annual capital costs continue to be paid to DWR to maintain this Allocation. Additional importation of State Water is discussed in section 10.0 *Potential Future Management Strategies*.

8.2.8 Additional Groundwater Monitoring

As saline intrusion has encroached further inland beneath the south Oxnard Plain, saline waters have moved eastward of the existing monitoring well network in some areas. In 2006, UWCD will install two additional nested monitoring well sites north of Mugu Lagoon, with funds obtained from a Department of Water Resources grant. These monitoring wells will be incorporated into the monitoring network and sampling protocol for the existing dedicated monitoring wells.

8.2.9 Calibration of Groundwater Extraction Meters

Resolution 2006-1 was adopted by the FCGMA Board that will phase-in a flow meter calibration and inspection program over three years. After the phase-in, each meter will be required to be checked at 3-year intervals.

8.3 EFFECTIVENESS TO-DATE OF CURRENT MANAGEMENT STRATEGIES

The management strategies applied over the past 20 years to combat seawater intrusion have resulted in significant changes in water levels and in water quality indicators in the FCGMA aquifers. Conditions in the Upper Aquifer System (UAS) have improved with groundwater elevations increasing to, or exceeding, acceptable levels and chloride-impacted water decreasing in both concentration and geographic extent in most areas. However, water quality conditions in the Lower Aquifer System (LAS) have worsened over this same time period. Specifically, LAS groundwater elevations in the southern portion of the Pleasant Valley Basin and southern Oxnard Plain Basin have decreased and remained well below sea level and salinity has increased in both concentration and geographic extent. This has occurred for two reasons. First, the combined UAS and LAS extraction in this area has exceeded levels the resource can support. Second, policies adding recharge to the UAS and switching pumping from the UAS to the LAS have relieved the stress on the Upper Aquifer but increased the stress on the Lower Aquifer.

The FCGMA policy of reduced pumping has had positive effects in all the aquifers. For pumpers using their Historical Allocation under Ordinance No. 5, there has been a pumping reduction in excess of the 15% currently required by the FCGMA. There have been only isolated incidents of pumping in excess of allocation, reflecting both the general acceptance of the pumping reductions and the stiff monetary penalty for overpumping. For agricultural pumpers using an Irrigation Efficiency calculation, pumping reductions have been even more dramatic. In a study using the FCGMA weather stations to calculate daily crop water demand, Agency-wide irrigation efficiency (measured by less reported water use compared to FCGMA-computed crop water demand) improved by about 30% during the first several years of the FCGMA pumping reductions (UWCD, 2002). The increased efficiency is consistent with the decreased extractions reported to the FCGMA over the last decade (see section 4.0

Groundwater Extractions). Widespread acceptance and installation of drip tape, micro sprinklers, mini sprinklers, leak repairs, computer controlled watering cycles, farm-operated weather stations to assist with irrigation frequency and duration, various ground-based moisture sensors and lysimeters, farmer and irrigation crew education, and a shift away from wasteful furrow irrigation or high volume sprinkler heads, along with reduction of tailwater losses have all contributed to the reduction in groundwater use.

One of the key hydrogeologic findings over the last 10 years indicated that a zone of lower conductivity (such as a fault or some other deformation) extends from the Camarillo Hills to Port Hueneme (aligned with the known location of the Simi-Santa Rosa fault in the Camarillo Hills) limiting the amount of recharge that can flow from the Oxnard Plain Forebay basin into the south Oxnard Plain and Pleasant Valley areas. This zone appears to be limited to the Lower Aquifer System, with no evidence that the lower conductivity zone extends upward into the Upper Aquifer System. In these areas of the LAS, extractions far exceed recharge, resulting in groundwater levels that have fallen to well below sea level from the ocean inland to the City of Camarillo. Three current projects recharge these critically overdrafted areas: diverted Santa Clara River water is delivered via the Pleasant Valley and Pumping Trough pipelines and diverted Conejo Creek water is delivered via the Conejo Creek project. These three projects deliver in-lieu recharge to the south Oxnard Plain and Pleasant Valley basins (the delivered surface water is used for irrigation in-lieu of pumping groundwater).

However, the Pumping Trough Pipeline (PTP) operated by UWCD provides mixed effects in reducing pumping in the Lower Aquifer System. The diverted Santa Clara River supplies delivered to PTP customers in-lieu of pumping groundwater have unambiguous benefits in helping to eliminate the pumping trough in the Upper Aquifer System and helping eliminate overdraft in the Lower Aquifer System. But the PTP project also has five LAS wells that provide irrigation water to customers along the pipeline when there are insufficient supplies in the Santa Clara River available for diversion and delivery. These wells were completed in the LAS because at the time the LAS was in better shape than the UAS. Since the UAS has substantially recovered from overpumping but the LAS has been severely depleted, these five LAS wells are no longer optimally-located; they now pump from the flank of the large pumping depression in the LAS of the south Oxnard Plain and Pleasant Valley basins. Thus, one of the previously-assumed solutions to reduce groundwater extractions within the pumping trough of the UAS has created new problems in the LAS. Some of this LAS pumping for the PTP project is being replaced by UAS pumping from the UWCD Saticoy Wellfield (located in the Oxnard Plain Forebay basin); this strategy should be maximized in the future.

One of the FCGMA strategies historically underutilized is the substitution of recycled water for groundwater pumping. The Conejo Creek project has begun the process of using recycled water which originates in the City of Thousand Oaks. Other recycled projects are not yet operational (e.g., see later discussion of the City of Oxnard's GREAT project).

The Ventura Regional Groundwater Model was used to test the future effectiveness of current projects to reduce the overdraft in the FCGMA basins. This analysis assumes that hydrological conditions of the past 50 years are similar to future conditions, that projects continue to be implemented as designed, and that FCGMA reported pumping is relatively accurate. This modeling indicates that when all current projects that implement the FCGMA Management Plan are operational, there will still be an overdraft in the basins within the Agency. With only current strategies in place, BMOs for groundwater levels would be met 51% of the time in the Upper Aquifer and 5% of the time in the Lower Aquifer (see Appendix B). This analysis is derived from the model Base Case, which uses reported pumping over the past 10 years as the basis for modeled extractions. If actual pumping was higher than reported, then the model would have to be recalibrated to reflect this. A sensitivity analysis was conducted to examine the effect of understated pumping in the model (Appendix B, section A2.2.2 *Sensitivity Analysis – Understatement of Reported Extractions*), which indicated that if agricultural pumping was understated by 15% (caused by poorly-calibrated meters or inaccuracies in other reporting methods), results from the current model could be up to 15 feet too high in the Lower Aquifer (the aquifers would be in worse shape than modeling suggested). If the model was recalibrated to reflect this understatement of pumping, these results would be corrected.

It is clear both from the modeling results and from the observation that BMOs are not being met in many areas, and that additional management strategies and projects must be initiated to alleviate this continued overdraft. The following sections address this need.

9.0 MANAGEMENT STRATEGIES UNDER DEVELOPMENT

There are several projects at various stages of development that will further reduce water supply and water quality problems within the FCGMA. Some of these projects follow the original management strategies of the Agency, whereas others deal with issues not contemplated in the original management plan. The strategies are presented in the order of their impact on the aquifer (high impact strategies are discussed first), with projects under development discussed in this section and future strategies discussed in the following section. The ranking of both strategies under development and future strategies that were amenable to testing with the groundwater model is indicated in Table 8. For strategies that could not be directly evaluated with the groundwater model (because there was no change in the place or amount of recharge or pumping), other ranking factors are discussed with each strategy.

Strategy	***UAS ΔWL***	***Meet UAS BMOs***	***LAS ΔWL***	***Meet LAS BMOs***
Current Strategies		**51%**		**5%**
Barrier Wells	+11’	63%	+46’	48%
GREAT Project	-1’	51%	+38’	36%
Injection River Water	+1’	53%	+7’	11%
Shift Pumping UAS	-1’	50%	+8’	9%
Increase River Diversions	+3’	54%	+3’	8%
Addtl Recharge S Oxnard	+1’	53%	+4’	7%
Continue 25% Reduction	+1’	53%	+2’	7%
Import State Water	+2’	54%	+1’	7%
RiverPark Recharge	<1’	52%	<1’	6%
Shift Pumping NW Oxnard	<1’	51%	<1’	5%
All Strategies	**+15’**	**67%**	**100’**	**76%**

Table 8. Ranked results of groundwater modeling of management strategies amenable to evaluation with the groundwater model. The table indicates the average change in groundwater levels expected in each aquifer at the wells for which there is a BMO for each strategy. The table also indicates the average amount of time that groundwater levels were at or above BMOs for each aquifer (see discussion of this technique in section 6.0*Basin Management Objectives*).

9.1 GREAT PROJECT (RECYCLED WATER)

The GREAT (Groundwater Recovery Enhancement and Treatment) project is ranked highest of the projects under development because of its effectiveness in reducing Lower Aquifer overdraft (see Table 8). However, the most effective portion of the project would occur at 10 to 15 years from now, when all components of the project are scheduled to be in place.

9.1.1 Description

The project is being designed and implemented by the City of Oxnard. The project has three major components: 1) a new regional groundwater desalination facility; 2) a recycled water system to deliver water to M&I non-potable water uses within the City of Oxnard, to deliver water to agricultural users in the Pleasant Valley area, and to inject water as a barrier to seawater intrusion; and 3) conveyance of desalination backwash concentrates through a brine line to either the City's existing ocean outfall or the Ormond Beach area for coastal wetland restoration. Potable water supplies for the City would then be pumped from the Forebay by utilizing FCGMA credits earned from both direct recharge (barrier wells) and in-lieu recharge (M&I non-potable and agricultural deliveries). This Forebay supply could be pumped from existing Oxnard-Hueneme system UAS wells, existing City wells, and/or new City wells. The FCGMA would have to approve recharge and pumping facilities, as well as implement policies discussed later in this section.

The project will be constructed in phases, with project yield ramping up over time from around 5,000 AFY to more than 21,000 AFY. Actual timing of construction will depend upon projected growth in water demand and funding. This project implements the strategy of pumping groundwater from areas of the aquifer readily recharged and reducing pumping in areas of the aquifer that are more difficult to recharge. In addition to offsetting existing potable water demands with recycled water supplies, this is accomplished by supplying in-lieu and injected recharge to the Pleasant Valley basin and south Oxnard Plain areas where it is needed most. A similar amount of water would be pumped from the Oxnard Plain Forebay basin. This strategy moves a considerable amount of extractions from areas that are overpumped to the easily-recharged Oxnard Plain Forebay basin.

Because M&I non-potable and agricultural demand is lower in the winter and recycled water cannot be effectively utilized during that time, a direct recharge component is necessary to accommodate the winter quantities of recycled water. A configuration of injection wells along Highway 1 and Hueneme Road was examined using the Ventura Regional Groundwater Model; this conceptual configuration is discussed in the EIR for the GREAT Project (City of Oxnard, 2005). Injecting water during only a portion of the year is less effective than with full-time injection; the addition of supplemental waters to use for injection is discussed as another strategy of this management plan.

Two FCGMA policy issues need to be addressed relative to the GREAT project. The FCGMA has allowed a one-for-one earning of storage credits – one acre-foot of stored water equals one acre-foot of storage credits – that has been applied to such projects as Calleguas MWD's Las Posas ASR project. When water is injected into a groundwater barrier to contain saline intrusion, however, some of the injected water will likely be tainted by the saline waters. The policy question then becomes whether the entire injected water should earn one-for-one storage credits; this is largely a policy decision rather than a technical decision.

The other FCGMA policy issue relates to pumping the storage credits from the Oxnard Plain Forebay basin. Moving the location of pumping to the Forebay is beneficial to the Pleasant Valley and Oxnard Plain basins, providing that the added pumping stress in the Forebay can be accommodated. For other strategies that involve pumping in the Forebay (e.g., Saticoy Wellfield, Supplemental M&I Water Program), there is a caveat that pumping not occur when groundwater levels have dropped below a threshold that applies to the use of water from the Freeman Diversion as a grant condition from the State Water Resources Control Board (available Forebay storage of 80,000 AF, using two index wells). Such a caveat is also appropriate for the GREAT project. The City of Oxnard can accommodate such an operational requirement by shifting its pumping to wells in the Oxnard Plain just outside of the Forebay when groundwater levels are low in the Forebay. The FCGMA should implement a general policy for all projects that shift pumping from overdrafted areas to the Forebay.

In addition, there are water quality concerns with injection of recycled water. The GREAT project will be performing a Title 22 analysis to permit this injection, which is administered by the Los Angeles Regional Water Quality Control Board with input from the California Department of Health Services. Water quality monitoring will be required by the permit; the FCGMA should review any proposed monitoring and comment to the Regional Board as needed.

9.1.2 Potential Effectiveness

This planned GREAT project would implement one of the strategies likely to be successful in restoring groundwater levels in the Pleasant Valley and Oxnard Plain basins. As part of the EIR for this project, the Regional Groundwater Model was used to test the effects of the project. The project was tested both at the lower initial yield and at full implementation. The effectiveness of the project must be judged by balancing raising Lower Aquifer System water levels in the Pleasant Valley basin and south Oxnard Plain areas against lowering water levels in the Oxnard Plain Forebay basin. The groundwater model indicated water levels in the LAS beneath the southern Oxnard Plain basin and the Pleasant Valley basin would rise by as much as 70 feet, whereas UAS water levels in the Forebay basin would only drop by about 5 feet during wet periods and 20 feet during dry periods. Thus, the project will have to carefully balance the positive and negative effects on water levels. Potential mitigation of lowered water levels in the Forebay include inducing more recharge from existing facilities and from potential increased diversion rights at the Freeman Diversion. The results of the groundwater modeling suggest that BMOs for groundwater levels would be met 51% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 36% of the time in the Lower Aquifer (compared to 5% with current management strategies) with full construction of the GREAT project.

If current recharge is reduced in the Forebay because of required fish flows or other reasons, then the Forebay basin may not be able to accommodate increased pumping, particularly in dryer periods. The City of Oxnard will conduct a monitoring program as part of the GREAT project to measure effects of the project. It would be prudent for the FCGMA to have a written agreement on operation of the GREAT project to ensure long-term operation of the project would continue to meet Agency strategies.

9.2 SOUTH LAS POSAS BASIN PUMP/TREAT

This management strategy is ranked high because it is in a mature stage of design and the problem that it aims to help solve is an ongoing problem for the Las Posas basin that needs a rapid solution to prevent further water quality degradation.

9.2.1 Description

As discussed in section 5.1.3 *High Salinity Associated with High Groundwater Levels*, high groundwater levels in the South Las Posas basin have apparently dissolved salts from the unsaturated portions of the shallow aquifer and created a mound of water more saline than ambient groundwater. One potential mitigation measure would be to pump the saline groundwater from the shallow aquifer, creating space in the aquifer thus allowing less-saline winter storm water to percolate into the aquifer. Under the current conditions, the majority of these winter flows now bypass the recharge areas because there is no available storage in the shallow aquifer. If implemented, this strategy would involve the pumped saline water being blended with low-chloride water and/or desalinated before delivery to customers.

Ventura County Waterworks Districts #1 (Moorpark) and #19 (Somis) are working with the Calleguas MWD to design and fund such a pilot project in the South Las Posas basin. The pumping associated with such a project would be in excess of current FCGMA allocations and would require approval of the FCGMA Board prior to implementation. Under FCGMA Resolution 2003-03, the Board indicated that upon its review and approval, it may change or alter an allocation for pumping from the South Las Posas basin to accommodate a responsible entity that submits a plan to render this groundwater usable. A general FCGMA policy for these types of projects in the future is discussed in section 11.3 *Recommended Additions to FCGMA Policies.*

9.2.2 Potential Effectiveness

The effectiveness of this particular strategy can be evaluated using two criteria. The first is the overall reduction in salts in the South Las Posas basin because higher-salinity groundwater is extracted and treated, removing salts from the system. The improvement in water quality in the basin would depend upon the amount of groundwater extracted and the amount of water recharged versus the ability of the aquifer or other sources to contribute additional dissolved salts. Another measurement of effectiveness would be the efficacy of drawing down the shallow groundwater to create space for recharge of better quality rain water. Greater drawdown could create conditions more favorable to recharge thus allowing more “fresh water” into the basin. It could also create space for addition salt-impacted waters. Thus, there are several factors that control the effectiveness of removing salts by pumping and treating the groundwater.

It is not possible at this time to adequately combine the factors to determine overall potential changes in water quality, although it is likely that dissolved salts removed during extraction and treatment would remove at least a portion of the salt load in the basin. Further analysis of nature and extent of the of the salts, quantification of the salt inputs (for example, mass balance), and evaluation of potential removal efficacy may be necessary to estimate the potential success of this strategy.

9.3 DEVELOPMENT OF BRACKISH GROUNDWATER, PLEASANT VALLEY BASIN

This strategy is also highly ranked because it can be implemented relatively quickly, may prevent water quality degradation in the northern Pleasant Valley basin, and would reduce pumping in the middle of the largest pumping depression in the Pleasant Valley basin.

9.3.1 Description

There are additional areas along Calleguas Creek besides the South Las Posas basin where groundwater has elevated salinity. Base flow from the Arroyo Las Posas has migrated completely across the South and East Las Posas basins and into the northernmost Pleasant Valley basin, providing a source of recharge to this portion of the Pleasant Valley basin. However, this recharge water has created water quality problems for groundwater pumpers. There are additional areas along Calleguas Creek besides the South Las Posas basin where groundwater has elevated salinity. Base flow from the Arroyo Las Posas has migrated completely across the South and East Las Posas basins and into the northernmost Pleasant Valley basin, providing a source of recharge to this portion of the Pleasant Valley basin. However, this recharge water has created water quality problems for groundwater pumpers. City of Camarillo wells in this area have experienced increased salts as groundwater levels have risen over the last decade (Figure 21), similar to the condition described in section 9.2 *South Las Posas Basin Pump/Treat*.

It is not yet clear if this recharge water from the Arroyo Las Posas will create a mound of poorer-quality groundwater that would move out into the main portion of the Pleasant Valley basin under recharge conditions. This would depend upon how well-connected the recharge area is to the main portion of the LAS in the Pleasant Valley basin. The City of Camarillo is considering a strategy to move some of its current pumping from the area of the LAS pumping depression in the central portion of the Pleasant Valley basin to the northern portion of the basin where rise in poorer-quality groundwater is being observed. Under this plan, the poorer-quality water would be extracted and desalinated in a similar manner to the South Las Posas basin project.

The City of Camarillo has assessed the feasibility of constructing a Groundwater Treatment Facility that would be located in the Somis Gap area of the Pleasant Valley Basin (Black and Veatch, 2005). The study determined the project to be technically feasible and would allow Camarillo to halt pumping from an area of the LAS with depressed groundwater levels and instead pump in an area of rising groundwater levels.

Camrosa Water District is considering another type of project that potentially develops the use of brackish groundwater. In an area of the eastern portion of the Pleasant Valley basin near California State University, Channel Islands along Calleguas Creek, Camrosa has been studying the possibility of extracting poor-quality Upper Aquifer(?) water, treating it, and putting it in their delivery system. This water, some of which was used historically, has risen to relatively high levels. Water quality monitoring in the adjacent main portion of the Pleasant Valley basin indicates that this poorer-quality water may not be migrating into the Lower Aquifer of the Pleasant Valley basin. Thus, there is the possibility this water could be pumped without lessening the supply to the Pleasant Valley basin. Some of this area is outside the FCGMA boundary.

Previously, both the potential Camarillo and Camrosa projects would have to be pumped using existing allocations if the well was within the FCGMA boundary. However, as FCGMA policy has evolved over time, pumping of poorer quality groundwater without an allocation has been evaluated on a case-by-case basis. A coordinated effort between the FCGMA and proponents of such projects in the Pleasant Valley basin should be undertaken to determine whether these projects are within this policy. Also, a feasibility analysis of these projects may be necessary to determine the potential net effects to the area and evaluate whether additional pumping would improve or degrade current water quality conditions. This FCGMA policy issue is discussed in more detail in Section 11.3 *Recommended Additions to FCGMA Policies.*

9.3.2 Potential Effectiveness

Pumping and removing salts from groundwater is an effective means of reducing the salt load in a watershed. If the areas from which the salts are removed are hydrologically connected to the main portions of the groundwater basins within the FCGMA, then this removal of salts could also have a positive impact. If the pumping of this poorer-quality groundwater does not affect the main groundwater basins, then these projects would have a neutral effect on the main groundwater basins while increasing the supply of available water. However, if these projects reduce the recharge to the FCGMA groundwater basins without also providing a significant benefit to water quality in these basins, than the projects could have a negative impact on the groundwater basins within the Agency. Any such projects would require monitoring of both water levels and water quality to determine their effect on adjacent areas of the basin.

The potential City of Camarillo project also has an element of moving existing pumping from the area of the Pleasant Valley basin near the Camarillo airport, which has the most-depressed groundwater levels, to an area more favorable for recharge along Arroyo Las Posas. The portion of the potential project related to the pumping reduction was tested using the Ventura Regional Groundwater Model (see Appendix B). Model results indicate that the worst portion of the pumping depression would be decreased considerably in size, leaving a smaller depression in the southern Pleasant Valley basin. The other element of the project, increasing pumping along the Arroyo Las Posas, cannot yet be tested effectively with the model. The model does not now capture the hydrogeology of the northernmost portion of the Pleasant Valley basin – a recharge area of the basin near Somis that is now apparent from monitoring data needs to be better understood and integrated into the model.

9.4 NON-EXPORT OF FCGMA WATER

This strategy is important in preventing additional un-authorized pumping within FCGMA basins, where additional strategies are required to mitigate current pumping. The strategy can also be implemented rather rapidly through FCGMA actions.

9.4.1 Description

Current policies and ordinances limit the use of groundwater produced from within the FCGMA to only those areas within the boundaries of the Agency with only rare exceptions. In 1997, original or prior historical uses outside the FCGMA boundary that were not known in 1985 were allowed through grandfathering of these uses. Since 1997, however, recent aerial photo analysis of new developments and additional crops grown near the FCGMA boundary indicate that there is a “fringe” of crops or additional lands being irrigated outside the boundary that are apparently being irrigated by groundwater produced from within the FCGMA. In most cases, these crops are contiguous across the FCGMA boundary from inside the boundary to outside the boundary; in some cases, the crops are grown on a parcel that spans the boundary. Some of these crops may have been planted in earlier years, but air photo analyses indicate that a portion of the crops have been planted in the last several years.

When the FCGMA was formed, it was envisioned that some undeveloped acreage within the FCGMA would be developed in the future and would create a new water use. A baseline allocation of one acre-feet per acre of water was to be allocated to any newly-developed lands. However, this baseline allocation was only for land within the FCGMA boundaries. If groundwater produced from inside the FCGMA boundaries was used on adjacent hillsides outside of the FCGMA boundary, this new irrigation would provide considerable extra draft on the groundwater basins. This additional draft on the aquifers is counter to all the FCGMA policies aimed at reducing pumping in the overdrafted aquifers.

Preventing this additional draft on the aquifers is clearly a high priority of this management plan. It appears that current ordinances and policies of the FCGMA may be sufficient to deal with its export issue, but this should be reviewed. What is needed is a regular procedure to both educate pumpers of the export policy and to identify areas where this policy has been violated. It is recommended that the FCGMA developed such a procedure and determine how to address past and current violations of this policy.

9.4.2 Potential Effectiveness

Preventing additional draft on the groundwater basins of the FCGMA is equivalent in effectiveness to pumping reductions. Many of the areas where water is exported across the FCGMA boundary are adjacent to the Pleasant Valley and Las Posas basins where lowered groundwater levels are particularly apparent. Therefore, much of this additional draft on the groundwater basins is occurring in the areas of the aquifer that can least sustain them. This fact increases the effectiveness of preventing these water exports.

9.5 CONTINUATION OF 25% PUMPING REDUCTION

This strategy is already in place, but is being reviewed by the FCGMA Board.

9.5.1 Description

Current FCGMA management strategies include the 25% reduction in pumping allocation that was called for in the original management plan. This management strategy is to continue the planned reductions as they were originality intended -- the planned reduction to 20% of allocation occurring during 2007 (delayed from 2005) and the 25% reduction occurring according to the 2010 schedule. These reductions were to stay in force until the FCGMA basins are no longer in overdraft and there is sufficient water for recharge to compensate for the increased pumping created when the restrictions are removed.

9.5.2 Potential Effectiveness

The original 25% pumping reduction has had the effect of reducing both M&I pumping and agricultural pumping (see section 8.3 *Effectiveness To-Date of Current Management Strategies*). The effect of continuing the phased reductions to the full 25% reduction was modeled using the Ventura Regional Groundwater Model. This model scenario assumed that pumping reductions beyond the current 15% reduction were applied only to M&I pumping; it was assumed that any agricultural wells currently using their reduced pumping allocation for FCGMA reporting would simply shift to an efficiency calculation, rather than further reduce pumping. The results of the modeling suggest that these additional pumping reductions, which amount to 3,800 acre-feet per year throughout the FCGMA, would raise groundwater levels in the Upper Aquifer System by a little over one foot at the Port Hueneme coastline and raise Lower Aquifer System groundwater levels by an average of a little over two feet. BMOs for groundwater levels would be met 53% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 7% of the time in the Lower Aquifer (compared to 5% with current management strategies).

9.6 RIVERPARK RECHARGE PITS

This strategy is being implemented through a Joint Powers Agreement between the City of Oxnard and United Water Conservation District.

9.6.1 Description

Decades of relatively unrestricted deep gravel mining beginning in the 1950s created a series of large open pits (formerly owned by S.P. Milling) along the Santa Clara River within the Oxnard Plain Forebay basin that are now unused and expose groundwater in the pits to evaporation and potential contamination. As part of an agreement between the City of Oxnard, a developer (RiverPark), the FCGMA, County of Ventura, and UWCD, these pits are being stabilized and urban surface drainage is being diverted away from the pits. If all the work on the pits is accomplished appropriately, the plan is to have UWCD operate the pits as a recharge and storage facility. UWCD would build a water conveyance system that would allow flood flows diverted at the Freeman Diversion to be transported to the RiverPark pits for recharge. These facilities would allow increased diversions of the Santa Clara River; silt-laden river water could be diverted and recharged, water that now must be bypassed and which flows to the ocean following large rainstorms.

Use of the RiverPark pits serves two purposes for the aquifer. First, the facilities will allow additional recharge to the aquifers from silty water that is now bypassed at the Freeman Diversion. Second, the project moves a portion of the Forebay recharge further down-gradient in the basin, away from the recharge mound that forms in the upgradient portions of the Forebay basin beneath the UWCD Saticoy Spreading Grounds. Thus, more recharge water will infiltrate into the Forebay during wet years, a time when a recharge mound builds in the upgradient portion of the basin and reduces recharge rates in existing spreading facilities. No FCGMA policy changes would be required to implement this project.

9.6.2 Potential Effectiveness

UWCD has analyzed the effectiveness of the RiverPark recharge project by combining UWCD's surface water model with the Ventura Regional Groundwater Model. This modeling suggests the yield of the project could be as much as 4,000 AFY (combined with a higher diversion rate at the Freeman Diversion), with the annual yield ranging from 400 AF in dry years to 11,500 AF in wet years. This additional recharge in the Forebay will raise water levels in the basin, which helps pressurize the greater Oxnard Plain. In addition, higher water levels in the Forebay basin will help mitigate the effects of other projects described in this management plan that rely on increased pumping in the Forebay.

The results of the groundwater modeling suggest that BMOs for groundwater levels would be met 52% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 6% of the time in the Lower Aquifer (compared to 5% with current management strategies).

10.0 POTENTIAL FUTURE MANAGEMENT STRATEGIES

Groundwater modeling indicates that additional management strategies are required to eliminate overdraft in both Upper Aquifer and Lower Aquifer System aquifers and to prevent further seawater intrusion along the coastline and saline intrusion in more inland areas. A variety of potential future strategies are ranked below, with those that are the most effective and can be implemented the soonest discussed first. Because of the large number of strategies, they are separated into those that can be implemented within 5 years, 10 years, 15 years, and greater than 15 years.

10.1 5-YEAR STRATEGIES

The following strategies that can be implemented within five years are ranked by order of effectiveness and/or importance.

10.1.1 5-Year Update of FCGMA Management Plan

10.1.1.1 Description

It is recommended that this Plan be updated every five years. This update should include a status of how the BMOs are being met, effectiveness of strategies that have been implemented, status of other recommended strategies, and recommendations for any additional management strategies.

10.1.1.2 Potential Effectiveness

Updating the Plan every five years will be an effective milestone for the FCGMA to evaluate and re-evaluate its course of action. This will keep the FCGMA's goals and its successes and failures front and center where they belong.

10.1.2 A Plan To Shift Some Pumping Back to Upper Aquifer System

10.1.2.1 Description

One of the initial groundwater management strategies for the FCGMA was to shift pumping to the Lower Aquifer System from the Upper Aquifer System to relieve pumping stresses that created a pumping trough in the UAS on the Oxnard Plain basin. This was accomplished by requiring new and replacement wells to be drilled in the LAS. Now that it is clear that the LAS cannot accommodate all this new pumping, it would be prudent to move some of the LAS pumping back to the UAS. However, this must be done very carefully to prevent a shift that would again create problems in the UAS.

A shift in pumping back to the UAS has already been initiated through County well permitting requirements. However, this shift cannot be uniformly enforced across the basins within the FCGMA. A detailed plan must be formulated that takes into account local recharge sources, hydrologic connection between portions of the basin, and current/future in-lieu recharge projects. This should be accomplished through use of the Ventura Regional Groundwater Model in fine-tuning the details of this plan, with the FCGMA, VCWPD, and UWCD working together.

10.1.2.2 Potential Effectiveness

By shifting pumping from the LAS to the UAS in areas where the Lower Aquifer System is not readily recharged could substantially raise groundwater levels in critical areas of the basins. This strategy only works, however, if the increased UAS pumping can be accommodated by the shift in pumping. For this reason, a sophisticated tool such as the Ventura Regional Groundwater Model is required to predict where and how much pumping should be shifted.

For an indication of how this strategy might work, 5,000 AFY of Lower Aquifer pumping was moved to the Upper Aquifer in the triangular area of the south Oxnard Plain from the Port

Hueneme zone of low conductance (fault?) to the western edge of the Pleasant Valley basin. The results of the groundwater modeling suggest that BMOs for groundwater levels would be met 50% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 9% of the time in the Lower Aquifer (compared to 5% with current management strategies) – raising Lower Aquifer water levels at BMO wells an average of 8 feet (Table 8).

10.1.3 Protect Current Sources of Recharge

10.1.3.1 Description

Protecting current sources of recharge to the FCGMA basins is particularly important as we face additional groundwater management problems. Maintaining Santa Clara River flows and water quality has been a focus for Ventura County over the past decade. The County of Ventura and UWCD went to court in the late 1990s to ensure that increasing land development and water use in the Santa Clarita area of Los Angeles County did not jeopardize Santa Clara River flows across the County line into Ventura County. More recently, local water agencies and especially the farming community have expressed concerned about rising chlorides from waste water discharges coming from Los Angeles County. It is very important to the FCGMA to continue to protect this important source of groundwater recharge through support of local agencies who deal directly with these issues.

On Calleguas Creek, where a portion of the flow originates from discharges produced by wastewater treatment plants, downstream users have come to rely on the increased flows in the Creek for recharge. Agreements on wastewater discharges flowing down Arroyo Santa Rosa resulted in the Conejo Creek project. Similar flows along the Arroyo Las Posas provide recharge to the Las Posas basins and the northern Pleasant Valley basin. The Arroyo Las Posas flows are augmented by discharges from the Simi Valley and Moorpark wastewater treatment plants and from dewatering of shallow groundwater in western Simi Valley. Similar to the Santa Clara River, maintenance of these flows is necessary to recharge the downstream groundwater basins. As such, the quantitative effects of shallow groundwater extraction in the Las Posas and northern Pleasant Valley Basins may need to be evaluated for the potential impacts to downstream surface water flows.

10.1.3.2 Potential Effectiveness

The current sources of recharge to the groundwater basins within the FCGMA are essential not only in maintaining current management strategies but also in implementing future strategies. Without protecting current recharge sources, the overdraft within the FCGMA could increase and negate some of the benefits realized by projects and strategies that have been very successful to date. Therefore, this strategy is one of the most effective in reducing overdraft, and is an essential FCGMA strategy.

10.1.4 Limitation on Nitrate Sources in Portions of the Oxnard Plain Forebay Basin

10.1.4.1 Description

High nitrate concentrations are present in groundwater in portions of the Oxnard Plain Forebay basin (see section 5.1.4 *Nitrate in Groundwater*). The source of a portion of this nitrate is from fertilizer use on overlying crops. A thick vadose zone (unsaturated zone) between the crops and the groundwater table allows natural processes to degrade some of the nitrate before it percolates with irrigation waters down to groundwater. Gravel pits within the Forebay were generally mined to five feet above historic groundwater levels, with reclamation plan restrictions on growing high-nitrate use crops within the mined pits where the vadose zone is so limited. As reclamation is completed, however, there are no longer crop restrictions. Thus, high-nitrate crops could be grown in these former gravel basins with a limited vadose zone.

The FCGMA should take a leading role in preventing further nitrate contamination in the Forebay. The FCGMA should work with land use planners and the Regional Water Quality Control Board to ensure that high-nitrate crops are not grown in areas with a limited vadose zone caused by gravel mining.

10.1.4.2 Potential Effectiveness

Limiting sources of nitrate is the most effective method of reducing nitrate in groundwater. Because nitrate is a primary drinking water contaminant that can cause serious adverse health effects and because the Forebay is a primary source of drinking water for consumers across the Oxnard Plain, limiting sources of nitrate should be a high priority for the FCGMA.

10.1.5 Policy on Recovery of Credits from Oxnard Plain Forebay Basin

10.1.5.1 Description

There are several management strategies that involve increased pumping in the Oxnard Plain Forebay basin to either supply water to overdrafted areas (e.g., Saticoy Wellfield) or to recover FCGMA credits earned by reducing pumping in overdrafted areas (e.g., Supplemental M&I Water Program, GREAT project). Using the Forebay in such a manner is definitely beneficial to both the Pleasant Valley and Oxnard Plain basins – however, it must be done in a manner such that the added pumping stress in the Forebay can be accommodated. For the Saticoy Wellfield and the Supplemental M&I Program, there is a caveat that pumping not occur when groundwater levels have dropped below a certain threshold. This threshold is the same as the grant condition applied to the use of water from the Freeman Diversion by the State Water Resources Control Board – that there is no more than 80,000 AF of available storage in the Forebay. In practice, this means that the average of combined groundwater levels of two index wells in the Forebay be above a certain level.

To assure a uniform policy, the FCGMA should implement a general policy for all projects that use FCGMA credits to shift pumping from overdrafted areas to the Forebay. It is recommended that this policy follow the State Board criteria discussed above and delineated in Table 9, or equivalent criteria if these wells are not available in the future. In addition, pumping using these credits should not adversely impact other pumpers in the basin. How these adverse impacts are defined will depend upon the specifics of each project and will have to be detailed when individual projects are approved by the FCGMA. It is also recommended that the FCGMA establish a policy for prioritizing the types of projects that can use transferred credits to pump in the Forebay. This will be especially important if there is more demand for these transfer projects than the Forebay can accommodate.

Wells Used	Groundwater Elevations
2N/22W-12R1 *2N/22W-22R1*	>17 ft above msl for combined groundwater elevations

Table 9. Criteria for using Credits for extraction in the Oxnard Plain Forebay basin.

10.1.5.2 Potential Effectiveness

Shifting pumping from an impacted area to the Forebay through the use of FCGMA credits is a very effective strategy, providing that this pumping doesn't adversely impact the Forebay. Using the criteria outlined in the previous paragraph, Forebay impacts can be avoided or mitigated.

10.1.6 Verification of Extraction Reporting

10.1.6.1 Description

Meters are required to be installed on all but domestic wells by Chapter 3 of Ordinance 8, although not all pumpers have installed meters or use their meters for reporting extractions. In addition, all extractions are self-reported and the accuracy of FCGMA extraction records relies on correct self-reporting. To ensure the accuracy of extraction records, which are used by the FCGMA and others to determine the changing pumping stress on the aquifers in the FCGMA, it is recommended that the FCGMA make periodic random checks on a small number of meters annually to ensure that meters are correctly installed and that the extractions reported by pumpers to the FCGMA correctly reflect actual meter readings.

10.1.6.2 Potential Effectiveness

The accuracy of FCGMA reporting records is important for extraction trends, determination of credits and efficiency, and overall compliance with pumping reductions. It is essential that all pumpers believe that everyone is "playing by the rules" and a verification procedure could help ensure that pumpers continue to believe that everyone is in this together.

10.1.7 Separate Management Strategies for Some Basins

10.1.7.1 Description

The initial FCGMA Management Plan treated all the FCGMA basins the same in that the same rules applied to all basins. We now know more about how these basins are interconnected and whether some of the basins have unique circumstances. For example, we know that the East Las Posas basin is largely hydraulically disconnected from both the West Las Posas basin and the northern Pleasant Valley basin. However, these basins also share some common elements; for instance, the East Las Posas basin and northern Pleasant Valley basin share a common recharge source, the Arroyo Las Posas. One element common to all the FCGMA basins is that they are overdrafted. Current FCGMA management strategies such as pumping reductions are thus appropriate to all the basins.

The FCGMA has considered localized management strategies. In the South Las Posas basin, for instance, a project to pump and treat poor-quality water without an allocation has been considered by the FCGMA Board. The strategy of moving pumping away from coastal areas applies largely to the Oxnard plain basin.

New strategies in this Management Plan are also applied to specific situations in each basin. The Management Plan for the East Las Posas basin, included as Appendix C, addresses issues specific to the operation of Calleguas' ASR project. This plan is adopted as part of the overall FCGMA Management Plan and the FCGMA Board will consider how its elements will be integrated into FCGMA ordinances. Likewise, the strategies for potentially pumping shallow groundwater along Calleguas Creek are also specific to the Pleasant Valley basin. The basin management objectives of this plan are also specific to each basin.

The FCGMA-wide strategy of pumping reductions across all FCGMA basins engenders the most discussion of whether this is appropriate in all cases. As discussed in section 9.5 *Continuation of 25% Pumping Reduction*, these reductions are appropriate across all FCGMA basins as long as there is overdraft in all basins. It would be appropriate, however, to re-evaluate any future additional pumping reductions by examining each basin separately.

10.1.7.2 Potential Effectiveness

The current strategy of allowing specific policies to address individual basin problems is the most effective means of addressing the overdraft and water quality problems within the FCGMA.

10.1.8 FCGMA Boundary

10.1.8.1 Description

The FCGMA boundary is defined as the outer edge of Fox Canyon Aquifer. In most areas, this outer edge is either the outcrop of the Fox Canyon Aquifer (such as along the north and east flanks of the Las Posas basin) or is the point where the Fox Canyon Aquifer onlaps older rocks (such as along the east side of the Pleasant Valley basin). However, along the western boundary of the FCGMA, it is defined as the western edge of the Oxnard Plain Forebay and Oxnard Plain basins (west of which the Fox Canyon Aquifer is not identified). Thus, this western boundary is also the boundary between the Oxnard Plain and Mound basins or the Oxnard Plain Forebay and Santa Paula basins.

Recent work done as part of the Santa Paula Basin Stipulated Judgment has moved the southern boundary of the Santa Paula basin farther north to coincide with the current known location of the Oak Ridge fault. This boundary of the Santa Paula basin was agreed to by experts working for the parties in the Santa Paula Basin Stipulated Judgment, including UWCD, the city of San Buenaventura, and the Santa Paula Basin Pumpers Association. In addition, UWCD groundwater staff have carefully monitored groundwater elevations in wells on both sides of this Santa Paula basin boundary and have confirmed that groundwater elevations south of the adjudicated basin boundary respond to recharge operations in the Oxnard Plain Forebay basin, whereas groundwater elevations to the north of the boundary do not. In addition, there is a significant discontinuity in groundwater elevations from one side of this boundary to the other.

The practical effect of this change in the Santa Paula basin boundary is that there is now a small region between the old and new boundary of the Santa Paula basin (Figure 28) that is not managed under either the Santa Paula Basin Stipulated Judgment or FCGMA rules and regulations. Because this area is in hydrologic continuity with the remainder of the Oxnard Plain Forebay basin, it would be appropriate to move the FCGMA boundary slightly north and east to coincide with the reinterpreted boundary of the Santa Paula basin and to reflect the reality of the continuity of this area with the Oxnard Plain Forebay basin. It is recommended that the FCGMA consider making this boundary change based on the technical information available.

10.1.8.2 Potential Effectiveness

By allowing a strip of land to be unmanaged through either the Santa Paula Stipulated Judgment or the FCGMA, it is possible to site wells on this strip of land and directly benefit from the significant recharge that takes place in the Oxnard Plain Forebay basin, meanwhile adversely affecting downgradient portions of the aquifers that rely on this recharge to repel seawater intrusion. By bringing this area into the FCGMA, wells sited in a strip of land will appropriately be subject to FCGMA extraction allocations and other management strategies. If the land described here is not brought into the FCGMA, it could invite unmanaged pumping that would adversely affect the basins within the FCGMA.

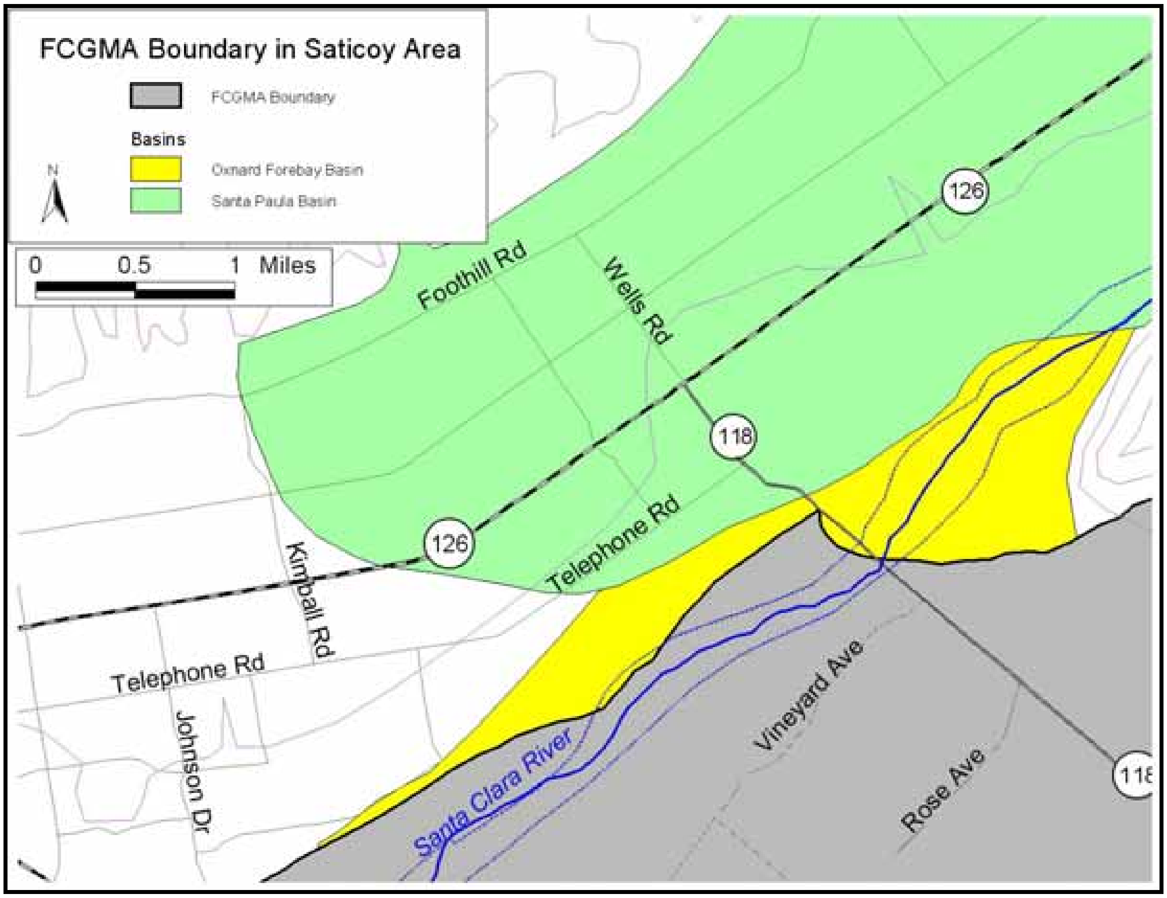

Figure 28. Area southeast of Santa Paula basin where FCGMA boundary is not coincident with current basin boundaries. The yellow area represents the portion of the Oxnard Forebay basin which is currently outside of the FCGMA.

10.1.9 Irrigation Efficiency Calculations

10.1.9.1 Description

Current FCGMA policies allow agricultural pumpers to meet a crop efficiency standard for their irrigation as an alternative to the Historical or Baseline allocation and credit program. This option is called the Irrigation Efficiency allocation. FCGMA efficiency calculations are based on daily information from a set of weather information gathering stations maintained across the FCGMA. Water demand for an index crop (cool season grass) is calculated daily. A crop factor is then applied to this index water demand to adjust the required water demand downward for four major categories of crops grown within the FCGMA. The final step in calculating crop irrigation efficiency is to adjust for 80% irrigation efficiency by taking the annual allowed water demand for each of the four major crop types and allowing an extra 20% water use for salt leaching and irrigation-system inefficiencies. The Irrigation Efficiency allocation was intentionally designed to make it possible for growers to sustain profitable agriculture within the FCGMA, but at the same time raise awareness of water conservation. The FCGMA should review the effectiveness of the efficiency allocation periodically to ensure that it being equitably applied.

In practice, Irrigation Efficiencies that pumpers report to the FCGMA are as a rule quite high – 100% to as much as 300% (water use as little as one third of estimated demand). This suggests the method of calculating Irrigation Efficiency may not be appropriate. Improving the method would not affect the vast majority of pumpers who now report high efficiencies. However, it may identify any pumpers who are not using irrigation water efficiently by making it more difficult for them to reach the minimum required efficiency. It is recommended that the FCGMA Board consider a strategy to examine the method of calculating Irrigation Efficiency. Topics to consider might include adjusting crop demand for more specific crops, re-examining the 80% efficiency requirement, and ensuring that acreages reported be actual irrigated acreage rather than total owned acreage.

10.1.9.2 Potential Effectiveness

It is not clear exactly what amount of reduction in agricultural pumping would occur by adjusting the Irrigation Efficiency calculation. As documented elsewhere in this Management Plan, agricultural pumping reported to the FCGMA has been reduced by as much as 30% since the FCGMA pumping restrictions were initiated. Thus, most agricultural pumpers have apparently increased their irrigation efficiency substantially over the last 15 years. As discussed above, the vast majority of those efficient pumpers are unlikely to be affected by any changes in the Irrigation Efficiency calculation. However, changes in the efficiency calculation might affect those pumpers who have not already improved their irrigation efficiency.

10.1.10 Additional Storage Projects in Overdrafted Basins

10.1.10.1 Description

Aquifer Storage and Recovery (ASR) projects, such as the Las Posas Basin ASR project, provide benefits to an overdrafted basin because water stored in the basin raises groundwater levels above what they would be without the project. The water is not permanently devoted to the basin, but is removed from time to time, generally during periods of water shortage in droughts or emergencies. In practice, the water generally remains in storage for multiple years and is not completely removed during extraction periods. Thus, there is a long-term benefit to the basin. Such projects need to be carefully designed so that neither recharge nor recovery adversely affects other users in the basin. The recovery periods generally cause a significant decline in water levels in the vicinity of the ASR wellfield, especially if the ASR is operated in a confined aquifer setting.

ASR projects are most effective in areas where groundwater levels have been substantially lowered by overdrafting and where the physical properties of the in-situ geologic formation are amenable to both efficient injection and efficient extraction. Within the FCGMA, the Pleasant Valley and south Oxnard Plain areas are both candidates for ASR projects under current conditions because groundwater elevations are continuously below sea level due to overpumping and the geologic formations in these areas have relatively high permeability and transmissivity (e.g., Densmore, 1996; Hanson et al., 2003). To make this strategy effective, saline intrusion currently evident in the south Oxnard Plain would need to be hydrologically isolated from any ASR project to protect the stored water from degradation and to prevent additional intrusion of saline waters during extraction of the stored water. An ASR project could potentially be paired with a barrier well project (discussed in section 10.3.1 *Barrier Wells in South Oxnard Plain*).

The available storage space in the Pleasant Valley and southern Oxnard Plain basins has not been rigorously calculated. The amount of water that has been extracted from coastal areas in excess of recharge has been calculate as about one million acre-feet since the 1950s (UWCD, 2006), with permanent loss of aquifer storage capability from resulting subsidence of about 200,000 AF. The remaining 800,000 AF of potential storage space in the aquifer has been partially refilled by intruded seawater, but there remains a large amount of potential aquifer storage space available.

10.1.10.2 ***Potential Effectiveness***

Storage projects can be effective in restoring groundwater levels in overdrafted basins. However, the restoration only occurs during the period when water is stored in the basin. For many storage projects, the period of storage can be many years and not all the stored water may be removed during the extraction phase of the project – in that case, there is a long-term positive effect on the basin.

There are two issues that must be addressed with any storage project to ensure that the project does not adversely impact a basin: 1) the storage project must not interfere with recharge to the basin by creating groundwater levels so high that there is rejected natural and artificial recharge; and 2) extraction of stored water must not adversely affect the basin and other pumpers by pulling in poor-quality water, dewatering clays and creating subsidence, or creating large cones of depression around project extraction wells that prevent nearby pumpers from using their wells efficiently. Mitigation of such potential impacts may be feasible. Higher groundwater levels from storage projects may also mask continuing overdraft in a basin, so it is essential to continually determine what the basin condition would be without the storage project. Such safeguards are part of the East Las Posas Basin Management Plan (Appendix C) with regards to the Las Posas Basin ASR project.

10.1.11 Penalties Used to Purchase Replacement Water

10.1.11.1 ***Description***

The FCGMA charges a penalty to pumpers for extracting more water than is allowed under the various allocations (Historical, Baseline, Irrigation Efficiency). Up to 2006, this has not generated significant revenue because few pumpers have exceeded their allocation. There may be circumstances in the future, however, where this may not be true. The increased groundwater use caused by the over-pumping could be offset by using the fees generated by penalties to purchase replacement water for the extracted groundwater. This is a strategy used by the Orange County Water District, where the penalty is called a Basin Assessment Fee. The FCGMA has several options to obtain additional water, including purchasing unused portions of Ventura County's State Water Allocation, paying M&I users to increase their imported/groundwater blend, and purchase of water through a variety of programs from the State or others such as turn-back pool water, Dry-Year Purchase Program, and other programs. This water could be delivered through either conveyance down the Santa Clara River or Calleguas MWD's pipeline, depending upon how the water was purchased and used.

10.1.11.2 ***Potential Effectiveness***

A FCGMA policy to purchase water to replace over-pumped groundwater would have a direct effect on the aquifers. If the replacement was done judiciously, more water could be purchased than was originally pumped and/or the water could be used for recharge particularly stressed areas such as the southern Oxnard Plain basin or the Pleasant Valley basin. Thus, the replacement water could actually improve groundwater conditions.

10.1.12 Additional Water Conservation

10.1.12.1 Description

There is a growing move to require the use of recycled water to replace non-potable uses in new developments in California. The FCGMA could encourage local cities and other planning agencies to require a dual plumbing system (where it meets plumbing code) in new developments where it is practical to deliver recycled water of suitable quality. The FCGMA could make this policy known to the permitting agencies through both a resolution sent to these organizations and by commenting on this issue when reviewing EIRs and other planning documents. This policy would be consistent with the requirements in some areas within the Agency, such as the County policy that requires all new golf courses to use 100% reclaimed water and the City of Camarillo that requires dual plumbing systems in new larger developments.

Another water conservation strategy is to require maximum feasible infiltration of stormwater within a new development (Low Impact Development). This strategy is only effective when the development overlies a recharge area for the aquifer. When a development overlies perched water or sealing clay near the surface, the infiltrated water does not benefit the aquifers.

10.1.12.2 Potential Effectiveness

The effectiveness of this policy in reducing pumping depends upon the amount of groundwater that would otherwise be pumped from groundwater and delivered to the project. Many water purveyors within the FCGMA serve a blend of groundwater and imported water, so the pumping savings would be in the groundwater component. The savings would also depend upon the amount of non-potable water needs or uses within these projects. Where there is substantial landscaping in a new project, for example, the savings in potable water would be more substantial. In developments that require a dual plumbing system, there have been estimated savings of 30% to 40% in potable water use just from outdoor landscaping.

As discussed above, the effectiveness of maximizing recharge of stormwater can be variable. When a development is located in a basin such as the Oxnard Plain Forebay, percolation of rain is an important component of recharge and should be protected. In areas where percolated surface water does not reach the aquifers, the strategy is not effective.

10.1.13 Shelf Life for Conservation Credits

10.1.13.1 Description

The initial 1985 FCGMA Management Plan set the policy that when a well operator pumped less than his allocation in any particular year, Conservation Credits were awarded for the unpumped portion of the allocation. The theory behind the Conservation Credit policy was that pumping would vary between wet and dry years; credits would be earned during wet years when pumping was reduced and the credits would then be used during the dry years when above-average pumping was required. With this scheme, pumping credits would theoretically zero-out at the end of each wet-dry cycle. However, no process was put in place to assure that large numbers of Conservation Credits were not accumulated beyond the end at each wet-dry cycle. The practical result of this policy is large numbers of Conservation Credits continue to accrue to some well owners – as many as tens of thousands of acre-feet of Conservation Credits have accrued to some organizations with multiple wells.

The current method of accumulating Conservation Credits with no expiration date has effectively left a large theoretical pumping debt on the aquifers (equivalent to several years of pumping at current extraction rates). This large debt complicates evaluation of the health of the basin because current groundwater conditions do not reflect this unused pumping debt. This is no different than judging a company's financial condition without considering monetary debt.

To bring FCGMA policy into line with the purpose for which credits were originally intended, several approaches are available. Perhaps the most important approach could be to have a limit on the annual use of these credits so that the aquifers would not be overly stressed in any single year. Another approach could be similar to that used in the adjacent Santa Paula basin, where the Stipulated Judgment from the basin adjudication allows unpumped allocations to be accumulated, but unlike in the FCGMA, any unpumped allocations for a single year expire after seven years. In this manner, accumulated debt is restricted to unpumped allocations earned within any single wet-dry cycle.

If unused credits were to expire after a period of time, the strategy would have to reflect a reasonable management strategy that takes into account the needs of pumpers, which vary by water use. For agricultural pumpers, credits are accrued for both future drought conditions and cropping changes. M&I pumpers may have accrued credits by substituting more-expensive imported water to provide a drought or emergency buffer. To ensure that any change in credit policy reflects these varying management strategies, the FCGMA should consider forming a committee (similar to the one that proposed the policy on calibration of meters) to study the issue and make recommendations on any policy changes. There are two issues that would need to be addressed – the shelf life on credits to be earned in the future and the fate of credits earned in the past.

This policy is not appropriate for Storage Credits, where water is stored for both dry periods and for emergencies such as earthquakes or levee failures in the Sacramento Delta. No change is recommended for Storage Credits.

10.1.13.2 __Potential Effectiveness__

The current policy for Conservation Credits allowing continuing accumulation makes it difficult to determine the current health of the basin – especially when the current pumping debt is equivalent to about three years' total pumping within the FCGMA. Modifying the FCGMA policy to expire older credits would allow a more accurate view of the health of the basin and would prevent a large pumping debt from accumulating. The effect a changed policy would have on future extractions within the FCGMA is not clear. On one hand, credit holders might be encouraged to pump credits prior to their expiration. This might effectively increase FCGMA pumping over its current levels, because some of these credits are currently being accumulated instead of being pumped. Alternatively, under the current policy of accumulating credits, many years-worth of accumulated credits could be pumped in a single dry year far exceeding any annual recharge, adversely impacting the groundwater basins through pulling in poor-quality waters and/or causing irreversible basin subsidence.

10.2 10-YEAR STRATEGIES

The following strategies that can be implemented within ten years are ranked by order of effectiveness and/or importance.

10.2.1 Additional In-Lieu Recharge to South Oxnard Plain

10.2.1.1 Description

One of the most effective management strategies in reducing overdraft is to supply water directly to overdrafted areas. This in-lieu strategy has been very effective in the Upper Aquifer System, where Santa Clara River water delivered through the Pumping Trough Pipeline has helped to alleviate the pumping trough that has been present for several decades beneath the south Oxnard Plain. Because the Lower Aquifer System now has its own pumping trough beneath the same area, extending the Pumping Trough Pipeline and/or bringing in water from other sources to the south Oxnard Plain would likely be equally as effective.

There are several options available to implement this strategy. UWCD could extend the Pumping Trough Pipeline to supply water to pumpers who are south of the current pipeline. The source of this water would likely be a combination of diverted Santa Clara River water and groundwater pumped from the Saticoy Wellfield located in the Oxnard Plain Forebay basin. UWCD has investigated such a project in the past, but costs were prohibitive. Another method of bringing water to the area would be to use Calleguas MWD's regional brine line (under construction in 2006) to bring recycled or other water from upstream areas, providing this water was of sufficient irrigation suitability. A third option would be to use water from Oxnard's GREAT project either for direct delivery to pumpers or for injection into the Lower Aquifer System. Any water delivered through an in-lieu program to this area should be eligible for credits. If there is any transfer of pumping back to the Oxnard Plain Forebay basin as part of a project using this strategy, then the considerations discussed in section 10.1.5 *Policy on Recovery of Credits from Oxnard Plain Forebay Basin* would be applicable.

10.2.1.2 Potential Effectiveness

Reducing pumping and/or injecting water into the aquifer in areas just inland of seawater intrusion can be a very effective strategy. Simulations of the Ventura Regional Groundwater Model that implement this management strategy have been shown to be effective in reducing the overdraft. For example, when 3,000 AFY of additional water are delivered or injected in the south Oxnard Plain, groundwater levels in the Lower Aquifer System rise by an average of 7 feet. The results of the groundwater modeling suggest that BMOs for groundwater levels would be met 53% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 7% of the time in the Lower Aquifer (compared to 5% with current management strategies).

10.2.2 Import Additional State Water

10.2.2.1 Description

As part of a joint integrated water management plan, UWCD and Calleguas MWD are considering expansion of State Water importation by obtaining additional amounts of Ventura County's State Water allocation on a year-by-year basis when it is not used by other Ventura County agencies. This additional water would likely be delivered to Lake Piru and released as part of UWCD's conservation release to benefit the Oxnard Plain. Currently, State Water is released from Lake Piru by UWCD as part of its conveyance of stored storm water to downstream basins. Typically, a portion of the released water percolates into basins upstream from the Freeman Diversions and the remainder of the water is diverted for recharge (direct and in-lieu). How this additional State Water is used and accounted for will likely depend upon how it is financed.

10.2.2.2 *Potential Effectiveness*

The effectiveness of new water importation depends upon how the water is recharged to the aquifers or delivered. If this imported water could be delivered to FCGMA pumpers in-lieu of pumping groundwater, then there would be a direct benefit to the aquifers from reduced pumping proportional to the amount of imported water. If, instead, this water was extracted by pumpers and substituted for a like amount of the imported water that would they would otherwise have delivered by Calleguas MWD, then the effects of the importation would be neutral. Thus, the ultimate fate of this additional imported water would govern the effectiveness of the strategy.

The Ventura Regional Groundwater Model was used to test the effectiveness of importing additional State Water. For the model scenario, the water was imported through Lake Piru, released with UWCD's annual conservation release down the Santa Clara River, diverted at the Freeman Diversion, and recharged in the Oxnard Plain Forebay basin. For the model simulation, it was assumed that 10,000 AFY of additional State Water were purchased in dry and average years. The results of the groundwater modeling suggest that Upper Aquifer groundwater levels in the Forebay basin would rise by an average of 6 feet. BMOs for groundwater levels would be met 54% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 7% of the time in the Lower Aquifer (compared to 5% with current management strategies).

10.2.3 Further Destruction of Abandoned or Leaking Wells

10.2.3.1 *Description*

With grant support, the FCGMA destroyed 49 abandoned or leaking wells that were considered by the FCGMA and UWCD to have the highest potential for cross-contamination from perched waters into the main aquifers within the FCGMA (cost and feasibility were also considered in ranking the wells for destruction). There remains a long list of additional wells that also have the potential for cross contamination of the aquifers. The FCGMA should give a priority to finding additional funds to continue this effort of well destruction.

10.2.3.2 *Potential Effectiveness*

Destroying abandoned or leaking wells is very effective in preventing cross contamination of aquifers within the FCGMA. In the Oxnard Plain and Pleasant Valley basins, perched waters have a much higher head (elevation) than underlying aquifers, so the conditions for cross contamination are widespread. Although there are documented cases of this cross contamination occurring, it is not known how widespread this has actually occurred.

10.2.4 Additional Monitoring Needs

10.2.4.1 *Description*

The current groundwater monitoring program has worked well in tracking saline intrusion beneath the Oxnard Plain. This monitoring network, along with a few other monitoring wells, were installed around 1990 by the US Geological Survey with financing provided by local agencies. Since the initial installation of the monitoring network, the continuing monitoring of these wells has been conducted by UWCD, VCWPD, and the City of San Buenaventura. As the saline intrusion on the south Oxnard Plain has moved inland, UWCD has sited and will drill two new multiple-completion monitoring wells inland of the saline intrusion. This increased monitoring program will adequately track water level and water quality trends on the south Oxnard Plain for the next several years.

In the Pleasant Valley basin, additional monitoring wells might be required if chloride levels continue to increase. The location of these potential monitoring wells would depend upon where the chloride increases occur. In the Las Posas basins, most of the existing monitoring utilizes existing production or injection wells. As part of the East Las Posas Basin Management Plan (Appendix C), new monitoring wells would provide information on the effects of the Calleguas Aquifer Storage and Recovery (ASR) project. Any such monitoring wells would likely be drilled by the Calleguas Municipal Water District. Monitoring of these wells would likely become a part of the overall Calleguas ASR monitoring program.

As more management strategies rely on increased pumping in the Oxnard Plain Forebay basin, increased monitoring will be required to ensure Forebay pumpers are not adversely affected or that pumping does not create additional groundwater problems. Increased monitoring in the Forebay has already been planned during operation of the UWCD Saticoy Wellfield. Additional monitoring should be required by the FCGMA for other projects where pumping will be shifted to the Forebay basin. An example is the GREAT project, where a substantial amount of pumping may be shifted to the Forebay; environmental documentation for the project proposes such increased monitoring. The exact monitoring required for any Forebay pumping that uses a transfer of credits should be appropriate to the location of increased pumping. At a minimum, this monitoring should include collection of monthly groundwater levels and quarterly water quality samples (to include constituents of concern such as nitrate and TDS) should include both Forebay monitoring and monitoring between the Forebay and the coast to determine potential effects in coastal groundwater levels.

10.2.4.2 Potential Effectiveness

Monitoring by itself does not solve the overdraft problem, but it is essential in determining the effectiveness of the other management strategies. In particular, monitoring provides the continuing evaluation of whether basin management objectives are being met, and often serves to increase the understanding of the dynamics of the multiple aquifer systems identified within the FCGMA.

10.3 15-YEAR STRATEGIES

The following strategies that can be implemented within 15 years are ranked by order of effectiveness and/or importance.

10.3.1 Barrier Wells in South Oxnard Plain

10.3.1.1 Description

Seawater barrier wells are used extensively in Los Angeles and Orange counties as a means of controlling seawater intrusion. A barrier project injects water along a series of wells creating a mound of recharge water as protection against seawater moving inland. Barrier wells are both expensive and complex, with costs of maintaining a barrier several times higher than for typical facilities in Ventura County such as the Freeman Diversion, spreading ponds, and distribution pipelines. In Los Angeles and Orange counties, there is a significant component of recycled water in the injected water. Thus, special health regulations govern this type of injection and are a necessary component of plans and facilities. In Ventura County, an attempt to construct a seawater barrier in the late 1970s and 1980s by the California Department of Water Resources in the Port Hueneme area was not particularly successful. Since that attempt, barrier wells were not seriously considered again because lower-cost options were identified.

We now know portions of the aquifer on the south Oxnard Plain are very difficult to recharge. In particular, the Lower Aquifer System of the south Oxnard Plain has been largely unaffected by spreading operations in the Oxnard Plain Forebay basin because this recharge is partially impeded from flowing into the areas of depressed groundwater levels by a fault or other structural barrier (see discussion in section 3.0 *Groundwater Basins and Hydrogeology – Oxnard Plain Basin*). The City of Oxnard GREAT project has evaluated barrier wells in the south Oxnard Plain as a method of delivering recycled water during winter months when agricultural irrigation demand is low. It may be prudent to consider expanding winter injection to more seasons of the year to create a full-time barrier. Additional source water for this full-time barrier would need to be identified.

A difficulty with barrier wells is that the injected water must be of very high quality to prevent clogging of the well screens. Thus, the source water for the injection would likely be a combination of highly-treated recycled water and potable water. The expense of building, maintaining, and providing water to a full-time barrier project currently makes such a project for Ventura County a lower priority. If other projects to supply in-lieu water to the south Oxnard Plain fail to prevent the increasing intrusion of saline waters or if a full-time barrier was considered as an add-on to injection wells already built through the GREAT project, then a full-time barrier project might be economically feasible.

As discussed in section 9.1 *GREAT Project (Recycled Water)*, FCGMA credits for recharge in a barrier project might be less than 1:1 because the recharged water might mix with contaminated saline groundwater. Likewise, if these credits are used for extraction from the Oxnard Plain Forebay basin, these extractions would have to follow uniform procedures addressed in section 10.1.5 *Policy on Recovery of Credits from Oxnard Plain Forebay Basin.*

10.3.1.2 Potential Effectiveness

Barrier wells could be very effective in preventing saline intrusion from moving further inland. Simulations of the Ventura Regional Groundwater Model indicate a barrier project with injection rates of 21,000 AFY into the Lower Aquifer System would raise Lower Aquifer water levels an average of 46 feet at the BMO wells, with an average groundwater elevation at the barrier of 28 ft msl. The rate of injection that was tested in the model was chosen to match the winter injection rate of the GREAT project at full planned implementation.

The groundwater modeling suggests that BMOs for groundwater levels would be met 63% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 48% of the time in the Lower Aquifer (compared to 5% with current management strategies. The barrier project is the most effective strategy modeled in meeting BMOs (Table 8). However, the barrier would not prevent saline intrusion in areas inland of the barrier within the LAS groundwater depression in the Pleasant Valley basin; the only prevention for saline intrusion within the groundwater depression would be to raise groundwater levels within the depression.

10.3.2 Injection of Treated River Water into Overdrafted Basins

10.3.2.1 Description

A management strategy that is commonly suggested is taking diversions from the Santa Clara River when there is abundant river flow and injecting it into the aquifers that have depressed water levels. However, raw river water could not be injected without treatment that would bring the water to at least drinking water quality to prevent well clogging and potential health concerns; the cost of this treatment was generally considered to be prohibitive when compared to other management strategies. This assumption may no longer be correct, as treatment costs become more affordable when compared to alternatives.

Much of the infrastructure to convey water from the Freeman Diversion to Pleasant Valley and the south Oxnard Plain already exists. The costs of the injection would be building a treatment facility, installing injection wells, and operating the treatment plant.

This injection would logically operate during periods when there is more water in the Santa Clara River than recharge facilities can accommodate. These conditions occur following rainstorms during many average precipitation years and can occur for extended periods (several months) during heavy precipitation years. The additional diversions could be conveyed to Pleasant Valley and the South Oxnard Plain via the existing Pleasant Valley and PTP pipelines. The raw water would then be treated and injected. Unlike aquifer storage and recovery (ASR) projects, the water would be placed in the aquifer for recharge purposes and would not be extracted at a later time as part of the project.

10.3.2.2 <u>Potential Effectiveness</u>

Besides reducing groundwater pumping in areas of lowered groundwater levels, providing direct recharge to affected aquifers is the most effective method of reducing pumping stresses and overdraft.

Injection of treated river water could be very effective in raising groundwater levels in the pumping depression in the south Oxnard Plain and Pleasant Valley basins. Simulations of the Ventura Regional Groundwater Model indicate an injection project with rates into the Lower Aquifer System of 1,500 AFY during dry years to 5,000 AFY during wet years would raise Lower Aquifer water levels an average of as much as 13 feet at the BMO wells in the area of injection.

The groundwater modeling suggests that BMOs for groundwater levels would be met 53% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 11% of the time in the Lower Aquifer (compared to 5% with current management strategies.

10.3.3 Increase Diversions from Santa Clara River

10.3.3.1 <u>Description</u>

The Freeman Diversion was designed to divert more river water than current diversions. However, the current water right for the Freeman Diversion permitted by the State Water Resources Control Board is only 375 cfs (cubic feet per second) because other conveyance facilities downstream of the Freeman Diversion were not designed for the higher flow rate. If these conveyance facilities were modified and additional spreading facilities were constructed to physically handle the additional volume of water, a right to a higher diversion rate could be beneficial during periods of high flow in the river. Any higher diversion procedure would have to be designed so that there was sufficient water available for environmental uses. In order to increase diversions at the Freeman Diversion, a modified water right would have to be obtained from the State Water Resources Control Board and appropriate State and Federal agencies would have to be consulted. UWCD is studying options for such an expansion.

10.3.3.2 <u>Potential Effectiveness</u>

The Santa Clara River remains the primary recharge source for the Oxnard Plain basin and supplies significant recharge to the Pleasant Valley basin. It is clear that increased recharge since the Freeman Diversion was constructed has had a major positive impact in reducing seawater intrusion in the Upper Aquifer System. Likewise, many other strategies of this

Management Plan rely on substituting pumping in areas of poor recharge to pumping in the Oxnard Plain Forebay basin, which is easily recharged by water diverted from the Santa Clara River. Additional diversions and recharge to the Forebay basin, therefore, are necessary to make other management strategies possible.

UWCD's River Routing Model was used to predict the amount of additional diversions that were possible from peak winter storm flows at the Freeman Diversion, within the current 1,000 cfs flow capacity limitation of key portions of the conveyance system. The model, which uses daily flow data, predicted that additional potential diversions ranged from an average of 3,000 AFY during dry years to an average of 43,000 AFY in wet years. This additional water was largely recharged in hypothetical recharge facilities in the RiverPark and Ferro mining pits.

The Ventura Regional Groundwater Model simulations suggest that the additional diversions have several beneficial effects. The additional recharge from the diversions raise groundwater levels in the Upper Aquifer of the Oxnard Plain Forebay basin by more than 10 ft, allowing the Forebay to fully fill during wet years and lessening the impact of the dry-year pumping envisioned in other strategies in this Plan. At Upper and Lower Aquifer wells with BMOs, average groundwater levels would increase by about 3 ft. BMOs for groundwater levels would be met 54% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 8% of the time in the Lower Aquifer (compared to 5% with current management strategies.

10.3.4 Shift Pumping to Northwest Oxnard Plain

10.3.4.1 Description

The northwest Oxnard Plain, in the area south of the Santa Clara River, has historically had groundwater elevations that have rarely gone below sea level. There are also no submarine canyons offshore of the northwest Oxnard Plain, eliminating a short-circuit route for seawater intrusion to reach coastal aquifers. Groundwater gradients in the Upper Aquifer System indicate that some of the water recharged to the UAS in the Forebay likely flows offshore in the coastal northwest Oxnard Plain basin. Thus, this portion of the aquifer might sustain some increased pumping without negative consequences. The amount of pumping that could be shifted to this area would depend upon the configuration of the pumping wells and the volume of pumping.

10.3.4.2 Potential Effectiveness

If pumping is shifted from areas that are difficult to recharge, such as the LAS in the southern portion of the Oxnard Plain basin and in the Pleasant Valley basin, to areas that are more-easily recharged, the effect is beneficial to the aquifers. Simulations of the Ventura Regional Groundwater Model indicate that with a shift of pumping of 2,000 AFY from near the edge of the Oxnard Plain Forebay basin to the northwest Oxnard Plain basin, groundwater levels improve less than a foot at wells with BMOs, but drop less than a foot in the northwest Oxnard Plain. Because the current groundwater levels in the Upper Aquifer of the northwest Oxnard Plain are more than 6 ft above their BMO, a more substantial shift in pumping could be accommodated, with a like amount of improvement in other areas of the coastal basins.

10.4 GREATER THAN 15-YEAR STRATEGIES

The following strategies that would be implemented later than 15 years are ranked by order of effectiveness and/or importance.

10.4.1 Additional Reductions in Pumping Allocations

10.4.1.1 Description

After other feasible strategies for reducing the overdraft within the FCGMA are considered, pumping reductions beyond the 25% may have to be examined. As discussed below, any further pumping reductions may not be necessary if most of the strategies discussed in this Plan are implemented. These strategies are likely to be expensive, however, so the FCGMA should retain as a further strategy additional pumping reductions if the means are not found to implement the strategies. Any additional required reductions should be effected using the current system of allocations and efficiencies. If this step is necessary, it would be prudent to revisit whether agricultural efficiency should be tightened up or continue to be used, or whether all pumpers should use the allocation/credit method of reporting. If significant portions of the strategies recommended in this Plan are not implemented, consideration should be given to applying further pumping reductions only in areas where groundwater levels are particularly depressed. For instance, as part of the evaluation of basin yield (section 7.0 *Yield of the Groundwater Basins*), a further reduction of 85% in pumping in the south Oxnard Plain and Pleasant Valley basins allowed groundwater elevations to meet Basin Management Objectives.

10.4.1.2 Potential Effectiveness

The necessity of any further pumping reductions was evaluated using the Ventura Regional Groundwater Model. This modeling suggested that with all strategies implemented, BMOs for groundwater levels would be met 67% of the time in the Upper Aquifer (compared to 51% with current management strategies) and 76% of the time in the Lower Aquifer (compared to 5% with current management strategies. Section 7.0 *Yield of the Groundwater Basins* discusses the issue of how often BMOs should be met to be protective of the basins in the FCGMA. The above numbers suggest that implementation of all the management strategies would vastly improve the health of the basins. Actual future observations of basin conditions, particularly the fate of sweater intrusion, will determine whether these strategies truly protect the basins. The modeling does suggest that further reductions in FCGMA extractions would not be warranted until the effect of the other management strategies can be observed or unless may of the strategies are not implemented because of financial or other reasons. However, implementation of a significant number of the strategies recommended in this Plan would be necessary to avoid further pumping reductions.

11.0 ACTION PLAN TO ATTAIN BASIN MANAGEMENT OBJECTIVES

11.1 PLANNING/IMPLEMENTATION ACTIONS

11.1.1 Strategic Planning

Many of the management strategies in this plan involve considerable cooperation among agencies within the FCGMA and come at considerable cost. The FCGMA is the common element among these agencies and is the appropriate forum in which to discuss the management strategies. Although many of the actual projects that would implement the management strategies would be built and managed by individual agencies within the FCGMA, the cost of the projects is likely to be spread to a wider group. Projects that have the most advantageous cost/benefit ratios would likely be supported by this wider group.

The FCGMA should initiate the discussion of how all the strategies fit together with current and future project of individual agencies. The topics to be covered could include:

1) Cost/benefit analyses of management strategies;

2) Cooperative efforts needed;

3) Methods to finance the projects;

4) Actions to implement the projects.

Parts of the analyses needed for the discussion have already been generated through agency's master planning efforts either within agencies or as larger cooperative efforts, and these plans cold be used as the starting point in these discussions.

11.1.2 Implementation

As a follow-up to the strategic planning effort, the FCGMA should take the results of the strategic planning and facilitate their implementation. The main focus of this effort would be to assist in cooperative efforts to implement the FCGMA management strategies.

11.2 RECOMMENDED CHANGES TO EXISTING FCGMA POLICIES

11.2.1 Continuation of 25% Pumping Reduction

Groundwater modeling of extending the phased FCGMA pumping reductions to their conclusion at 25% reductions indicated that this policy results in modest improvements at BMO indicator wells. Despite these modest improvements, it is necessary to continue this policy because the modeling also indicated that it will take the combination of all of the strategies recommended in this Plan to reach BMO goals – although individual strategies may not make large contributions, the sum of these strategies is the key to solving the overdraft problem. It is recommended that the FCGMA Board implement the delayed reduction to 20% before the end of 2007 and implement the reduction to 25% on the 2010 scheduled date.

11.2.2 Credits to be Transferred to Forebay Basin

Current water conservation facilities and FCGMA policies encourage reduced pumping in areas of seawater intrusion or overdrafted areas by moving those pumping stresses to areas that are more readily recharged. Examples of these projects are the Oxnard-Hueneme Pipeline system, the Pumping Trough Pipeline, and the Pleasant Valley Pipeline. A more recent transfer is for credits accrued by the Conejo Creek project to be used for extractions from the Oxnard Plain Forebay basin as part of the Supplemental M&I Water Program. The program has criteria to prevent adverse impacts from this increased pumping in the Forebay, including a restriction on pumping when groundwater elevations in key wells in the Forebay are below pre-determined levels.

The FCGMA should establish a policy for future credit transfers to the Forebay. This policy should include both criteria to ensure that projects do not harm the Forebay and to prioritize future projects if there is more demand for these transfers than the Forebay can accommodate. The Conejo Creek-Supplemental M&I Water projects serve as a good model for future projects that would provide in-lieu recharge or injection through wells in overdrafted areas and then recover that water from the Forebay or other areas that are readily recharged. Any such pumping using FCGMA credits should be able to demonstrate that a plan for increased pumping would not adversely impact the basin pumped. The FCGMA should encourage these types of projects, as long as there is a net benefit to the aquifers and the pumping does not adversely affect that basin. Specific criteria that the FCGMA could use for future projects are discussed in section 10.1.5 *Policy on Recovery of Credits from Oxnard Plain Forebay Basin*.

11.2.3 Shift Some Pumping from Lower Aquifer System to Upper Aquifer System

A shift in pumping back to the UAS has already been initiated through County well permitting requirements. However, this shift should not be uniformly enforced across the basins within the FCGMA. A detailed plan must be formulated that takes into account local recharge sources, hydrologic connection between portions of the basin, and current/future in-lieu recharge projects. This should be accomplished through use of the Ventura Regional Groundwater Model in fine-tuning the details of this plan, with the FCGMA, VCWPD, and UWCD working together.

11.2.4 Irrigation Efficiency Calculation

As discussed in section 10.1.9 *Irrigation Efficiency Calculations*, the irrigation efficiency calculation should be revisited to ensure that the methodology gives appropriate results. The FCGMA Board should convene a committee of experts and stakeholders to examine the efficiency methodology. This committee would incorporate current methods of determining crop demand, including recommending updated weather station technology if necessary. The purpose of this exercise is to ensure that the efficiency calculations submitted to the FCGMA by agricultural irrigators are accurate. Any changes to the methodology should focus on improving actual irrigation efficiency by pumpers and ensuring pumpers reporting actual groundwater use against their allocation are on the same “level field” as those using irrigation efficiency.

The committee would also review whether 80% irrigation efficiency is appropriate to current farm management methods or whether this efficiency percentage should be changed. The committee should be convened within six months of adoption of this Management Plan. Recommendations of the committee would be presented to the FCGMA for possible modification of current ordinances.

11.2.5 Additional Monitoring

Additional monitoring may be required by the FCGMA when certain management strategies are implemented. For instance, projects that rely upon new pumping from the Forebay basin, as a result of water delivery to areas that are not as readily recharged such as the south Oxnard Plain, may require additional monitoring to ensure that other Forebay pumpers are not adversely impacted. It is recommended that this additional monitoring be a condition of approval for applying pumping credits to the Forebay when they are earned elsewhere within the FCGMA.

Additional monitoring is also required as part of the East Las Posas Basin Management Plan (Attachment C). This additional monitoring is incorporated in the FCGMA Management Plan by reference.

In addition, monitoring should also be required for projects in the future that pump poor-quality water without an allocation along Calleguas Creek. This monitoring would focus on detecting both improvements in water quality in the pumped area and un-anticipated changes in water levels or water quality in adjacent portions of the FCGMA aquifers.

11.2.6 Use Penalties to Purchase Replacement Water

The FCGMA charges a penalty to pumpers for extracting more water than is allowed under the various allocations (Historical, Baseline, Irrigation Efficiency). The increased groundwater use caused by the over-pumping could be offset by using the fees generated by penalties to purchase replacement water for the extracted groundwater. The FCGMA has several options to obtain additional water, including purchasing unused portions of Ventura County's State Water Allocation, paying M&I users to increase their imported/groundwater blend, and purchase of water through a variety of programs from the State or others such as turn-back pool water, Dry-Year Purchase Program, and other programs. This water could be delivered through either conveyance down the Santa Clara River or Calleguas MWD's pipeline, depending upon how the water was purchased and used.

11.3 RECOMMENDED ADDITIONS TO FCGMA POLICIES

11.3.1 5-Year Update of FCGMA Management Plan

It is recommended that this Plan be updated every five years. This update should include a status of how the BMOs are being met, effectiveness of strategies that have been implemented, status of other recommended strategies, and recommendations for any additional management strategies.

11.3.2 Separate Management Plans for Some Basins

All of the basins within the FCGMA are managed under an umbrella of this Management Plan. However, there are circumstances in some of the basins that require additional management policies, such as in the East Las Posas basin. It is recommended that the FCGMA Board adopt the East Las Posas Management Plan (Appendix C) by resolution. In addition, the policies on pumping and treating poorer quality groundwater without an allocation should be incorporated into FCGMA policy by adopting this overall FCGMA Management Plan.

It is recommended that no changes be made to current FCGMA pumping reductions that treat all the FCGMA basins the same. It would be appropriate to revisit this policy in the future if basin management objectives have been achieved in a particular basin; the FCGMA Board might consider whether it is appropriate to continue with additional pumping reductions.

11.3.3 Adoption of Basin Management Objectives

The basin management objectives recommended in this Management Plan should be adopted by resolution by the FCGMA Board. As additional information becomes known about individual groundwater basins, it may be appropriate to modify the recommended objectives and/or to add additional objectives.

11.3.4 Extractions of Poor-Quality Water Without an Allocation

There are additional areas along Calleguas Creek besides the South Las Posas basin where groundwater has elevated salinity. Base flow from the Arroyo Las Posas has migrated completely across the South and East Las Posas basins and into the northernmost Pleasant Valley basin, providing a source of new recharge to this portion of the Pleasant Valley basin. However, this new recharge water has created water quality problems for groundwater pumpers. City of Camarillo wells in this area have experienced increased salts as groundwater levels have risen over the last decade, similar to what has already happened in the South and East Las Posas basins.

Extraction of this groundwater is an appropriate groundwater management strategy providing that either: 1) extracting the groundwater improves the overall water quality in the basin without also causing overpumping of the basin or 2) extracting the groundwater provides a new water supply outside of those currently allocated by the FCGMA. If these conditions are not met, then the extractions should be debited against an existing allocation. In the South Las Posas basin, for example, pumping and treating the shallow groundwater would both improve the water quality and not reduce supplies to the basin (better quality stormwater that now bypasses the basin would then have the ability to infiltrate and replace the pumped water). Alternatively, if shallow groundwater along Calleguas Creek was not hydraulically connected to the main portion of the basin, and pumping that groundwater would have no effect on groundwater in the main basin, then pumping this groundwater could provide a new supply of water. This lack of hydrologic connection would have to be demonstrated using standard geologic techniques. These techniques would include analysis of groundwater levels, water quality parameters, well logs, age-dating, geochemical analyses, or other techniques.

11.3.5 Barrier Wells

As discussed in section 10.3.1 *Barrier Wells in South Oxnard Plain*, construction of injection barrier wells near the coastline to prevent landward migration of saline intrusion is one management strategy. Under current FCGMA policy, any project in the future that has barrier wells as a project component would need FCGMA approval to earn extraction credits that could be used to pump a like amount of groundwater elsewhere within the FCGMA. As discussed in section 10.1.5 *Policy on Recovery of Credits from Oxnard Plain Forebay Basin*, there may be issues related to the pump-back. It is recommended that any such FCGMA approval be contingent upon analysis of the potential effectiveness of the barrier in the improving water quality, analysis showing that pumping credits earned by injection that are used elsewhere does not adversely affect the pumped area, and a monitoring program to measure the effects of both the barrier wells and the extraction wells.

11.3.6 Protecting Recharge Supplies

Because of the importance of preserving current recharge sources for the aquifers and potentially adding additional recharge, the FCGMA adopts a policy that protects these recharge sources. Although the FCGMA cannot determine water rights, it will use its influence with other agencies to ensure protection of the recharge sources. FCGMA actions might include writing letters of support, discussing the issues with other agencies, and testifying at hearings related to these recharge sources.

11.3.7 Nitrate Sources in Oxnard Plain Forebay Basin

It is recommended that the FCGMA develop a policy to limit high-nitrate crops in reclaimed gravel basins where there is little or no vadose zone for degradation of the nitrate before it reaches groundwater. The particulars of this issue are discussed in section 10.1.4 *Limitation on Nitrate Sources in Portions of the Oxnard Plain Forebay Basin*.

11.3.8 Additional Conservation Measures

It is recommended that the FCGMA Board adopt a policy encouraging all planning agencies within the FCGMA to require dual plumbing in new developments where treated wastewater is feasible for use. As part of this policy, the FCGMA should work with planners to incorporate these policies into general plans and other appropriate planning documents.

11.3.9 Verification Procedure for Extraction Reporting

It is recommended that the FCGMA establish a verification procedure to ensure that self-reporting of extractions by pumpers to the FCGMA is accurate. This procedure could be as simple as an annual random inspection of a few meters to ensure that the meter is installed and that the readings that are reported to the FCGMA agree with the meter readings.

11.3.10 Consideration of Further Pumping Reductions

If most of the effective strategies recommended in this Plan are not implemented because of cost, lack of cooperation, lack of will, or some other factor, the FCGMA should consider further pumping reductions. The actual reductions required would depend upon how the basins have responded to the strategies that have been implemented, and the required reductions could be determined using the groundwater model at that time.

12.0 SUMMARY OF FCGMA MANAGEMENT STRATEGIES

FCGMA management strategies are separated into three categories – current, in development, and future. Each strategy has a short description. For a full discussion of each strategy, refer to the earlier three sections on management strategies. Some of these strategies related directly to FCGMA ordinances and other actions. Many of these strategies are carried out by agencies other than the FCGMA, but FCGMA policies either encourage these projects or make them possible through the credit program.

12.1 CURRENT STRATEGIES

Includes those within the original 1985 FCGMA Management Plan and those that have been developed since that time:

- <u>Limitation of Groundwater Extractions</u> – 25% phased reduction in pumping, including 80% agricultural efficiency.
- <u>Encourage Both Wastewater Reclamation and Water Conservation</u> – Encouraged use of recycled water and water conservation techniques.
- <u>Operation of the Oxnard Plain Seawater Intrusion Control Project (UWCD's Pumping Trough Pipeline, Lower Aquifer System Wells, Freeman Diversion)</u> – Encourage UWCD projects.
- <u>Annual Groundwater Monitoring Program</u> – Conducted by VCWPD and UWCD.
- <u>East and West Las Posas Basin Pumping Restrictions</u> – Restricted water use outside La Posas basin and FCGMA boundary.
- <u>Monitor FCGMA Groundwater Extractions</u> – Program of reporting extractions to FCGMA.
- <u>Implementation of Drilling and Pumping Restrictions</u> – Various policies for aquifers used for water production and for well completions.

- Metering of Groundwater Extractions – Required meters on all except domestic wells.
- Fox Canyon Outcrop Expansion Area – Grandfathered some historic areas where groundwater pumped from within the FCGMA is delivered outside of Agency boundaries.
- Noble Spreading Basins – Encouraged expanding UWCD historical artificial recharge areas.
- Las Posas Basin ASR Project – Set criteria for Aquifer Storage and Recovery project in Las Posas basin.
- Conejo Creek Diversion Project – Allowed credits for diversion and delivery of water to pumpers in-lieu of their pumping groundwater.
- Supplemental M&I Water Program – Allowed credits earned in Pleasant Valley basin to be pumped from Oxnard Plain Forebay basin which is more easily recharged.
- Saticoy Wellfield – Groundwater pumped by UWCD from Oxnard Plain Forebay basin is delivered to pumpers in Oxnard Plain and Pleasant Valley basins in lieu of pumping local groundwater.
- Importation of State Water – Credits earned by UWCD for importing State Water for recharge are put in a special account to help solve management problems in the future.
- Calibration of Groundwater Extraction Meters – Meters on wells will now be re-calibrated every three years.

12.2 STRATEGIES UNDER DEVELOPMENT

Includes strategies in which planning and design of projects is currently taking place:

- RiverPark Recharge Pits – Encourage additional recharge facilities in Forebay.
- GREAT Project (Recycled Water) – Credits earned from in-lieu deliveries and injection of recycled can be pumped from Forebay.
- South Las Posas Basin Pump/Treat – Poor quality water can be pumped and treated without using credits.
- Development of Brackish Groundwater, Pleasant Valley Basin – Poor quality water may be able to be pumped and treated without using credits.
- Non-Export of FCGMA Water – Enforce current restrictions on water export; determine procedure for periodic evaluation of whether there are new water exports.

12.3 FUTURE STRATEGIES – 5 YEARS

Includes strategies that could be implemented within the first 5 years (ranked in order of effectiveness):

- 5-Year Update of FCGMA Management Plan – Regular updating of plan, report on BMOs and progress

- Plan to Shift Some Pumping Back to Upper Aquifer System – Shift some new wells back to UAS, with area and number to be determined jointly with UWCD using Ventura Regional Groundwater Model.
- Protect Current Sources of Recharge – Use FCGMA influence with regulatory agencies to ensure that sources of recharge such as the Santa Clara River are not degraded or unduly dedicated to non-recharge uses.
- Limitation on Nitrate Sources in Portions of the Oxnard Plain Forebay Basin – Limit high-nitrate crops in reclaimed gravel basins in Forebay where a vadose zone is either very thin or missing.
- Policy on Recovery of Credits from Oxnard Plain Forebay Basin – Adopt a recommended policy for transfer of credits for pumping in the Oxnard Plain Forebay basin.
- Verification of Extraction Reporting – Annually check a few random wells for meter use and accurate reporting of meter readings.
- Separate Management Strategies for Some Basins – Adopt East Las Posas Basin Management Plan.
- FCGMA Boundary – Adjust FCGMA boundary to conform to Oak Ridge fault and boundary with Santa Paula Basin Adjudication.
- Irrigation Efficiency Calculations – Consider modifying calculations for Irrigation Efficiency Allocation.
- Additional Storage Projects in Overdrafted Basins – Consider storage projects in Pleasant Valley and perhaps southern Oxnard Plain basins, ensuring that the storage does not interfere with current groundwater uses or recharge to the basin.
- Penalties Used to Purchase Replacement Water – Use penalties for pumping beyond allocation to purchase water for recharge to the aquifers.
- Additional Water Conservation – Encourage agencies and cities to require dual plumbing in new developments, where possible, to replace groundwater use with recycled water.
- Shelf Life for Conservation Credits – Allow Conservation Credits to expire after a wet-dry cycle to bring credit policy in line with goals of this program.

12.4 FUTURE STRATEGIES – 10 YEARS

Includes strategies that could be implemented within 5 to 10 years (ranked in order of effectiveness):

- Additional In-Lieu Recharge to South Oxnard Plain – Deliver additional water to southern Oxnard Plain to offset pumping.
- Import Additional State Water – Import and recharge more of Ventura County's State Water Allocation.

- Further Destruction of Abandoned or Leaking Wells – Seek grant funding to reinstate program of destroying abandoned or leaking wells that pose a risk of cross contamination of FCGMA aquifers.
- Additional Monitoring Needs – Support UWCD and VCWPD in determining additional monitoring needs as contamination threats evolve.

12.5 FUTURE STRATEGIES – 10 TO 15 YEARS

Includes strategies that could be implemented within 10 to 15 years (ranked in order of effectiveness):

- Barrier Wells in South Oxnard Plain – Develop a policy for credits for water injected in barrier wells.
- Injection of Treated River Water into Overdrafted Basins – Treat diverted river water to drinking water quality and recharge it through injection in Oxnard Plain and Pleasant Valley basin.
- Increase Diversions from Santa Clara River– Increase diversions of high-volume storm flows for recharge.
- Shift Pumping to Northwest Oxnard Plain – Shift some pumping to the more easily recharged northwestern Oxnard Plain.

12.6 FUTURE STRATEGIES – GREATER THAN 15 YEARS

Includes strategies that could be implemented more than 15 years from now (ranked in order of effectiveness):

- Additional Reductions in Pumping Allocations – As a last resort if the other strategies fail to meet Basin Management Objectives, consider reducing allocations beyond the required 25% reduction. Also consider focusing these reductions in the south Oxnard Plain and Pleasant Valley basins where groundwater levels are particularly depressed.

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A 1.0 APPENDIX A - PROGRESSION OF SEAWATER INTRUSION BENEATH THE SOUTH OXNARD PLAIN

Although seawater intrusion under the Oxnard Plain has been studied over several decades, the details of the intrusion have not been analyzed until recently when United Water Conservation District (UWCD) entered all historic data on water levels, water quality, and well construction into digital databases and GIS coverages so the entire data set could be analyzed systematically. This new analysis uses all this digital information to construct a series of maps depicting groundwater levels and chloride concentrations in wells within the south Oxnard Plain from as far back as 1920. The analysis used 5-year time slices in both the Lower Aquifer System and Upper Aquifer System to determine when groundwater levels first dropped below sea level, when chloride levels first increased as a result of the landward gradient caused by these lowered groundwater levels, and the progression of saline water since that time.

Saline intrusion is recognized in monitoring wells by concentrations of chloride and Total Dissolved Solids (TDS) that are several times higher than the Basin Plan Objectives of 150 mg/L and 1,200 mg/L, respectively. In practice, the leading edge of the intrusion is mapped on the Oxnard Plain as the first occurrence of chloride in excess of 500 mg/L., which is used in the following set of maps.

Groundwater levels first dropped below sea level in the period 1945-49 in the Upper Aquifer System (Figure 34), although groundwater levels were scarce at the coastline for some years prior to that time. In the following 5-year time slice of 1950-54 (Figure 35), groundwater levels dropped below sea level across much of the south Oxnard Plain, and chlorides increased to as much as 1,925 mg/L at the Port Hueneme coastline. Thus, the apparent time lag between groundwater dropping below sea level and the encroachment of seawater was somewhere in the range of 5 to 10 years. In the following 5-year time slice of 1955-59, chlorides increased rapidly in coastal wells, reaching as high as 27,350 mg/L (Figure 36).

Although a few sampled wells may have had corroded casings that allowed poorer-quality perched water to flow into the well, most of the early chloride readings were taken from pumping wells with a smaller chance of significant cross-contamination during sampling (groundwater flowing into pumping wells would likely come mostly from screened intervals in the well). Outliers of wells with poorer quality water were not considered in the interpretation of the areas of saline intrusion to minimize random instances of cross-contamination; it was only concentrations of wells with poor quality water that were considered as significant. Within the first 20 years of intrusion, higher chloride levels were evident up to 3 miles inland from the area of initial intrusion, an intrusion rate of about 800 feet per year. This rate of intrusion is similar to rates calculated for seawater intrusion in the Salinas groundwater basin (e.g., CDWR, 1973).

The intrusion of the Upper Aquifer System in the Port Hueneme area was temporarily arrested during the mid 1980s following a wet climatic cycle (e.g., Figure 42). As the new FCGMA policies, the Freeman Diversion, and the PTP Pipeline came online, chloride levels in the Port Hueneme saline lobe in the Upper Aquifer System continued to decrease, with chloride concentrations in some wells near the coastline returning to drinking-water quality. However, chloride levels remain high in smaller lobes centered around both Port Hueneme Harbor and Mugu Lagoon (Figure 44). Unfortunately, some of the saline water intruded around Port Hueneme did not exit via the canyon when high water levels return. Unquantified amounts of saline water were transported to the southeast along the coast by the prevailing (non-drought period) groundwater gradient.

Intrusion in the Lower Aquifer System lagged considerably in time behind the Upper Aquifer System. Groundwater levels near the coastline first went below sea level in the 1955-59 time period (Figure 48), but high chlorides were not detected until the 1985-89 time period at Port Hueneme and the 1990-94 time period near Point Mugu (Figure 52, Figure 53), some 30 years later. This time lag is partially caused by the longer travel time for seawater intruded from the Lower Aquifer System outcrops along the offshore Hueneme Submarine Canyon walls and partially the result of the lack of monitoring points right at the coastline until the USGS monitoring wells were drilled in the late 1980s and early 1990s. As discussed in section 5.0 *Water Quality Issues*, the U.S. Geological Survey interpretation is that the majority of the saline intrusion in the Lower Aquifer System near Point Mugu is saline water being pulled from surrounding sediments rather than from the ocean itself (see Figure 56).

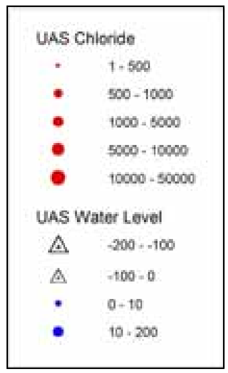

Figure 29. Legend for Figure 30 to Figure 44 for Upper Aquifer System time slices. Chloride concentrations are in mg/L, water level is elevation above or below mean sea level. All maps are oriented with north to the top of the page. Area of map coincides with location map in Figure 2 in section 2.0 *Background of Groundwater Management and Overdraft Within the FCGMA.*

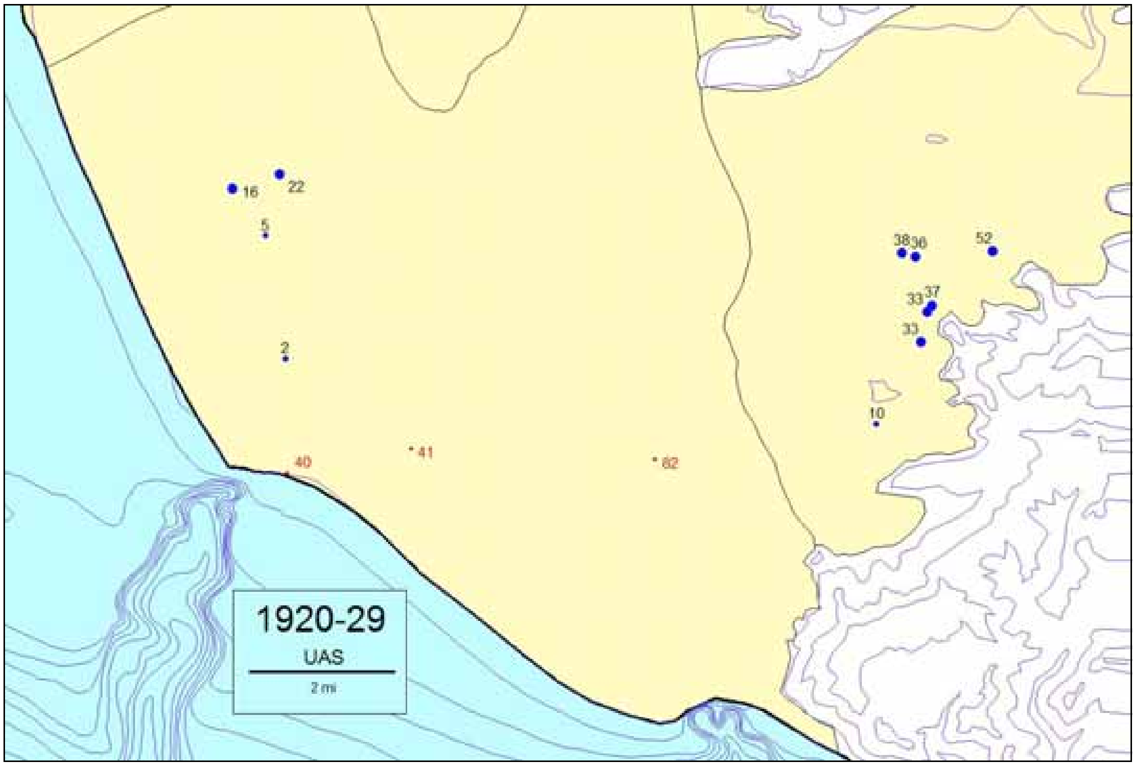

Figure 30. Upper Aquifer System groundwater levels and chloride levels, 1920 to 1929. Legend is shown in Figure 29. Line in title block is two miles in length.

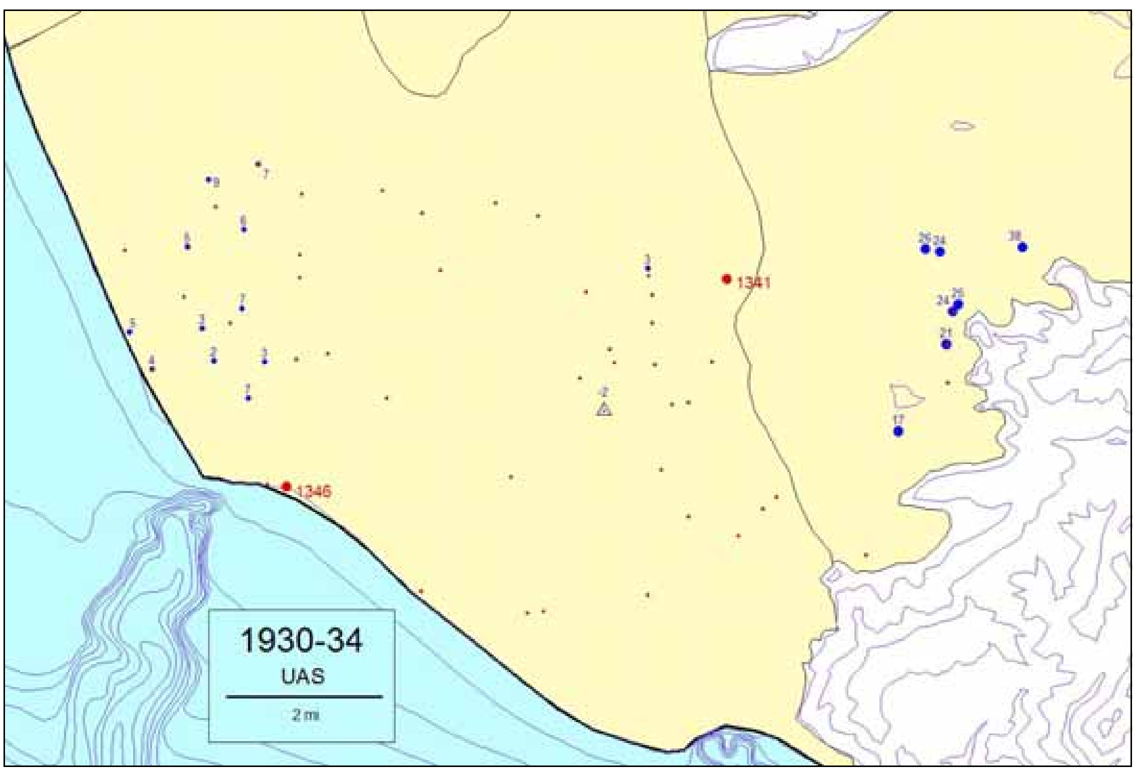

Figure 31. Upper Aquifer System groundwater levels and chloride levels, 1930 to 1934. Legend is shown in Figure 29. Line in title block is two miles in length.

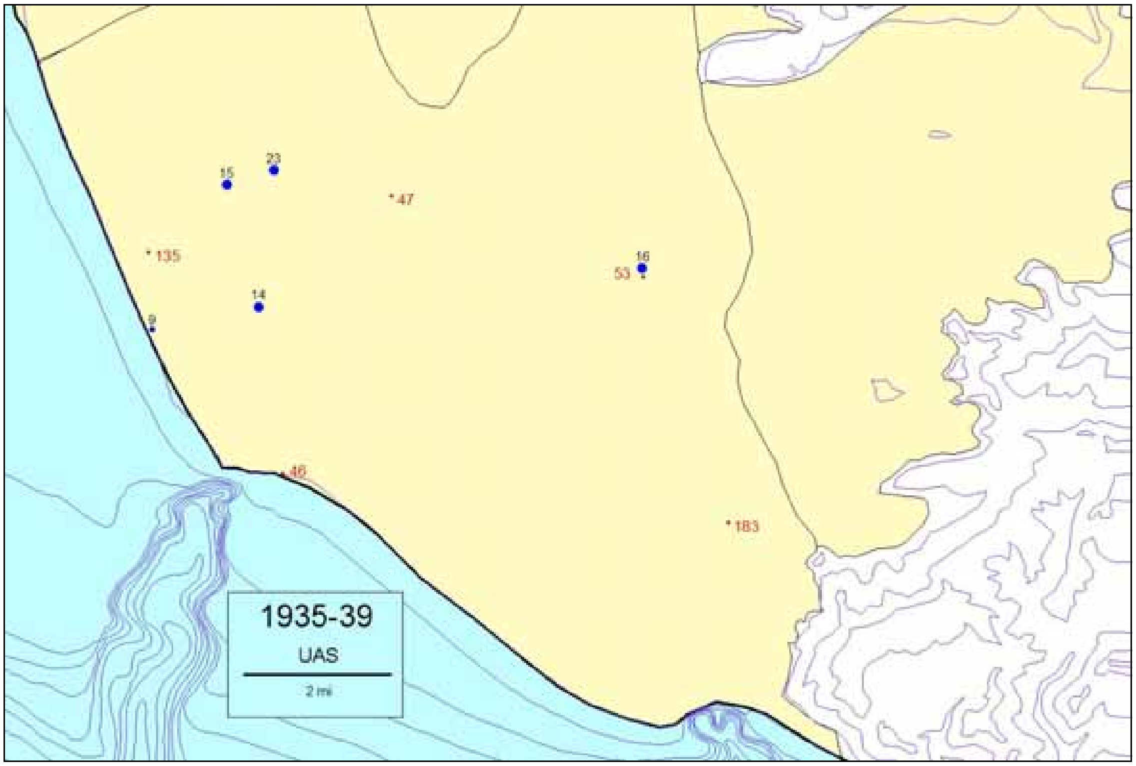

Figure 32. Upper Aquifer System groundwater levels and chloride levels, 1935 to 1939. Legend is shown in Figure 29. Line in title block is two miles in length.

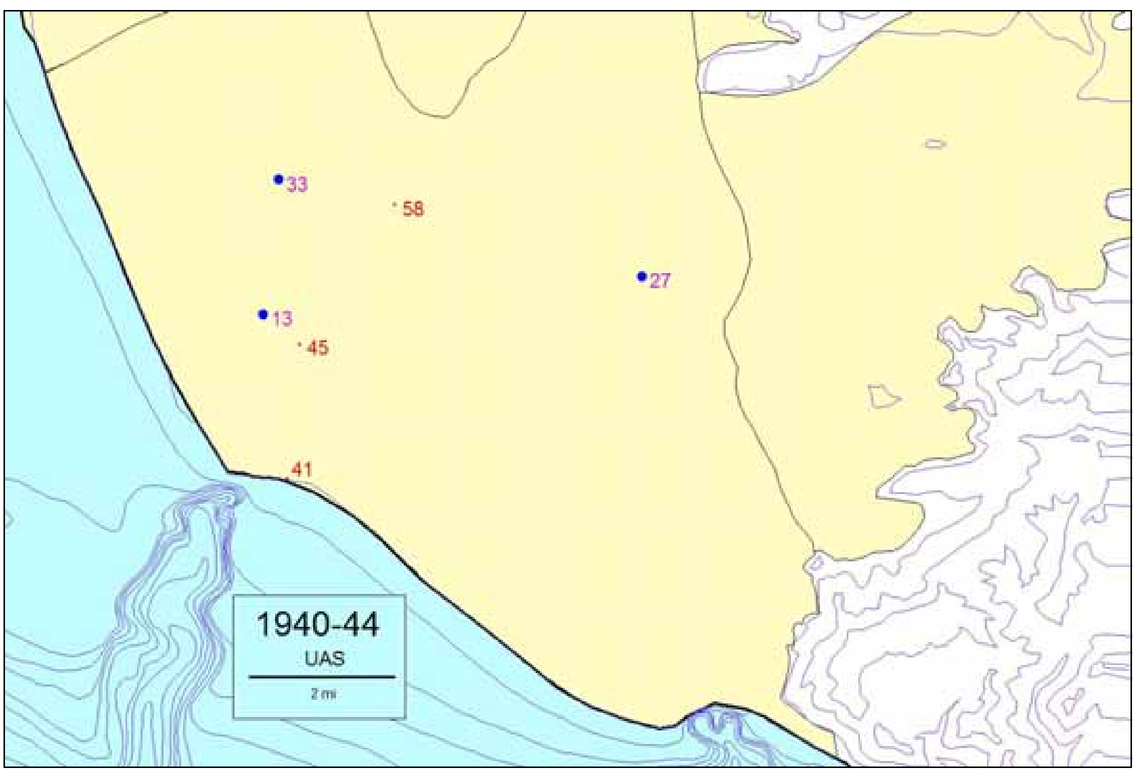

Figure 33. Upper Aquifer System groundwater levels and chloride levels, 1940 to 1944. Legend is shown in Figure 29. Line in title block is two miles in length.

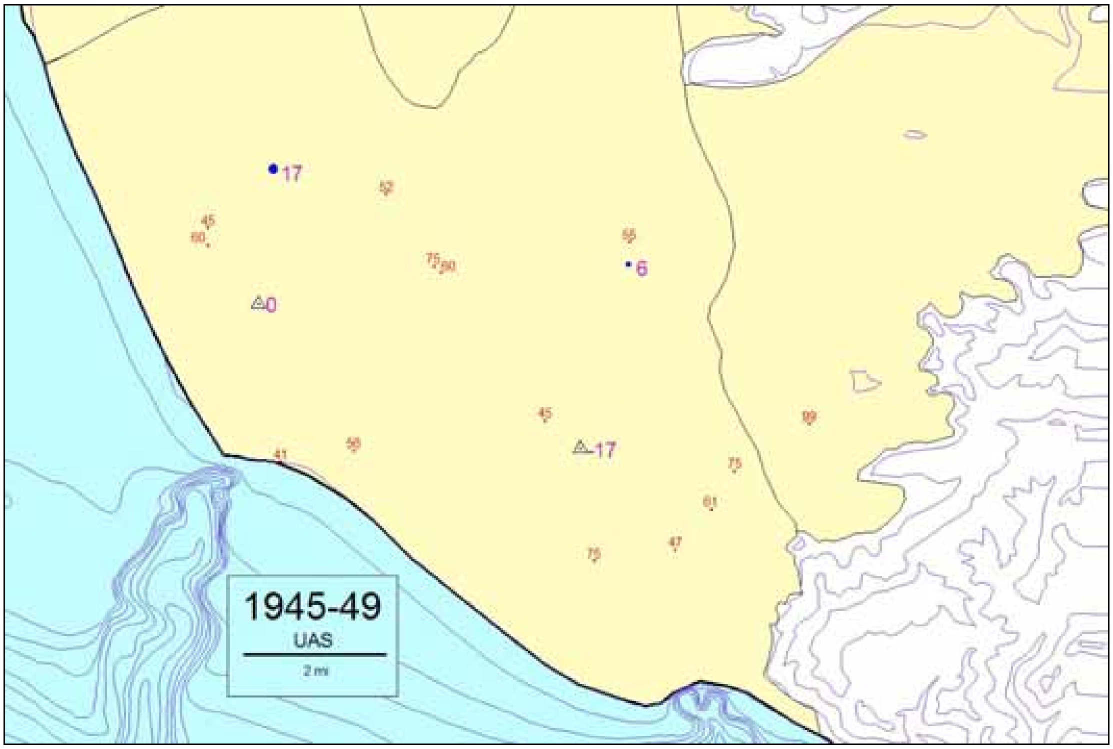

Figure 34. Upper Aquifer System groundwater levels and chloride levels, 1945 to 1949. Legend is shown in Figure 29. Line in title block is two miles in length.

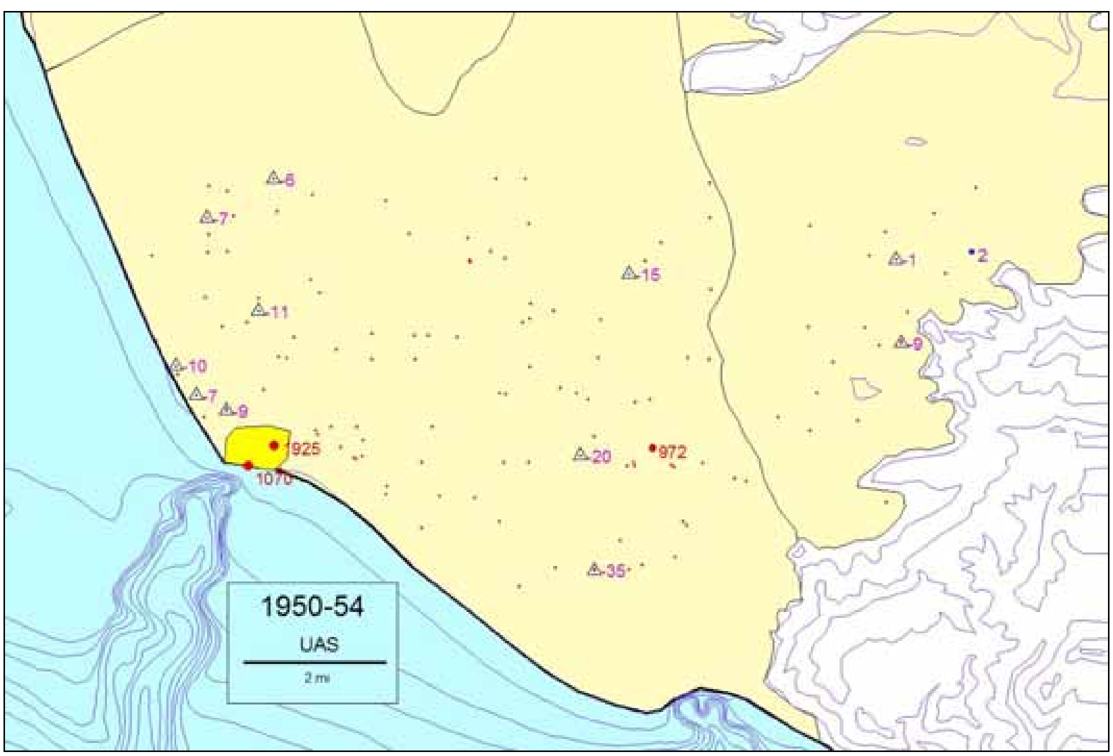

Figure 35. Upper Aquifer System groundwater levels and chloride levels, 1950 to 1954. Legend is shown in Figure 29. Bright yellow area is intruded by seawater near Hueneme Submarine Canyon. Line in title block is two miles in length.

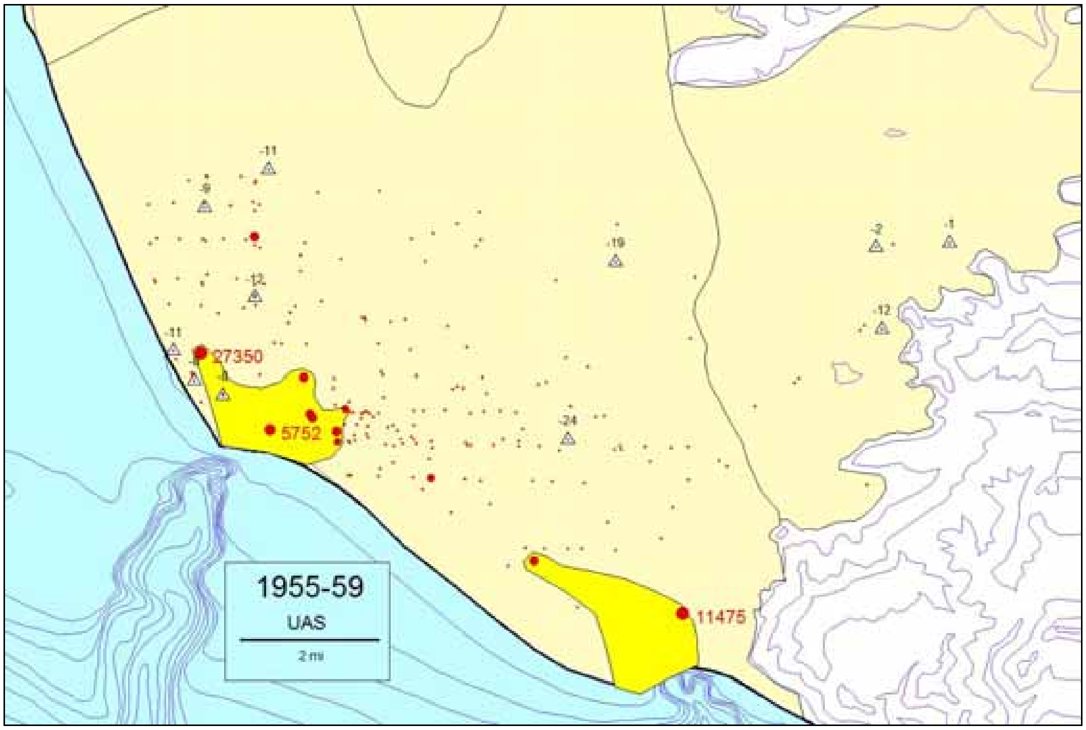

Figure 36. Upper Aquifer System groundwater levels and chloride levels, 1955 to 1959. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

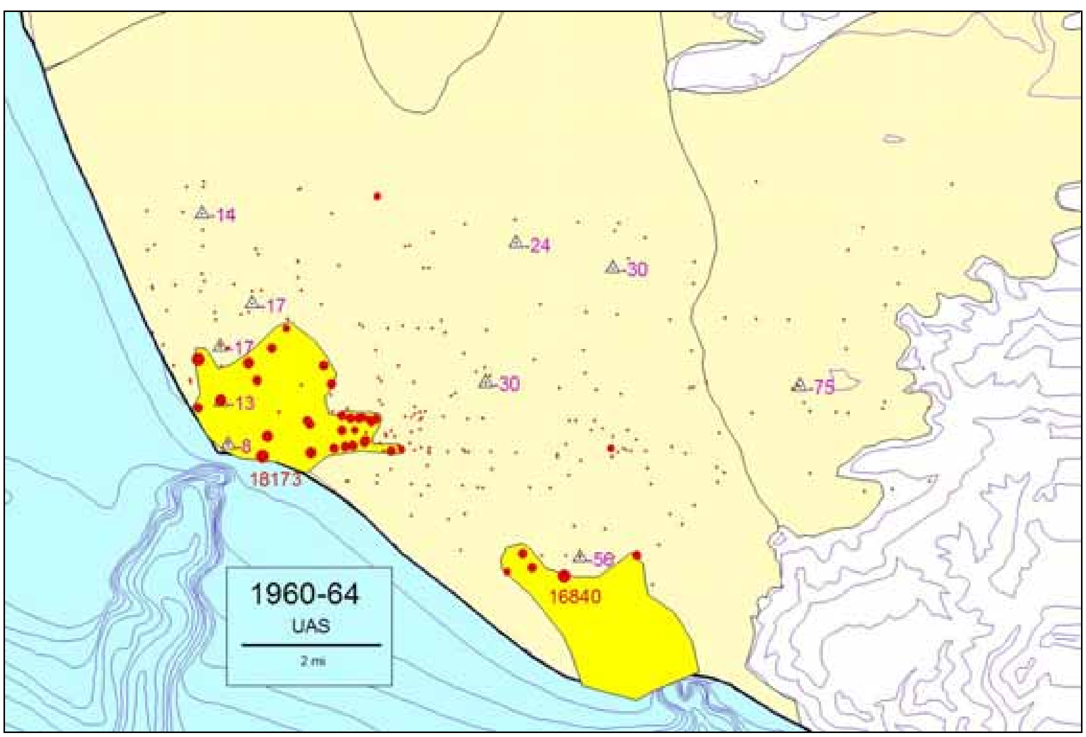

Figure 37. Upper Aquifer System groundwater levels and chloride levels, 1960 to 1964. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

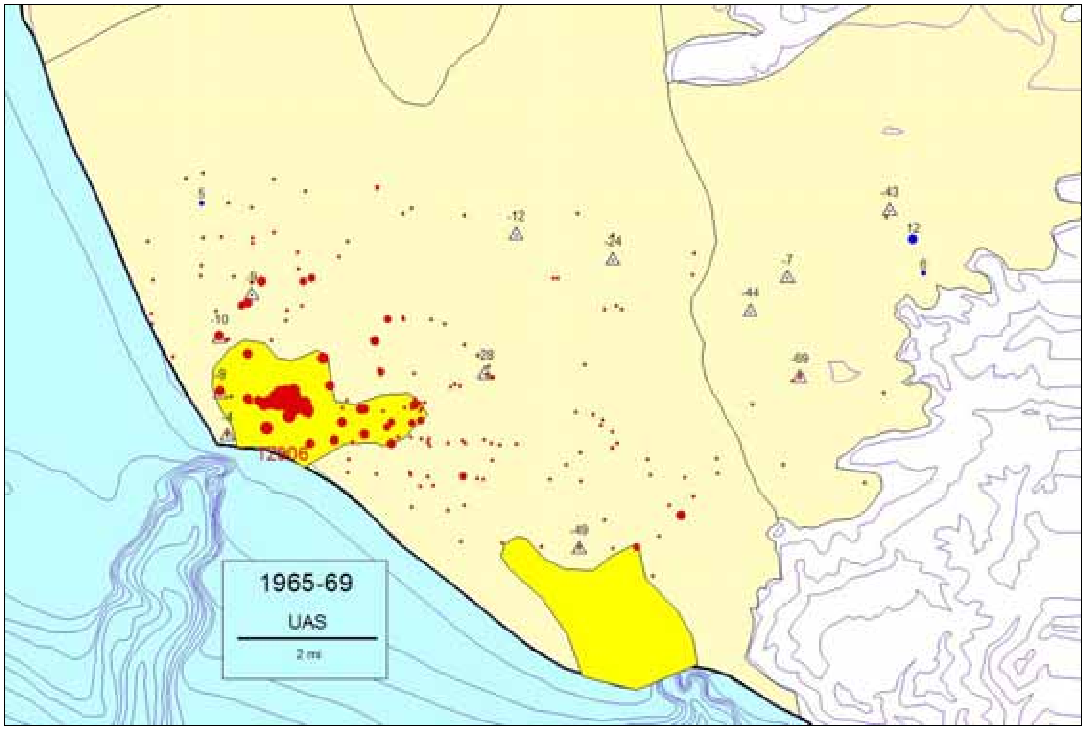

Figure 38. Upper Aquifer System groundwater levels and chloride levels, 1965 to 1969. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

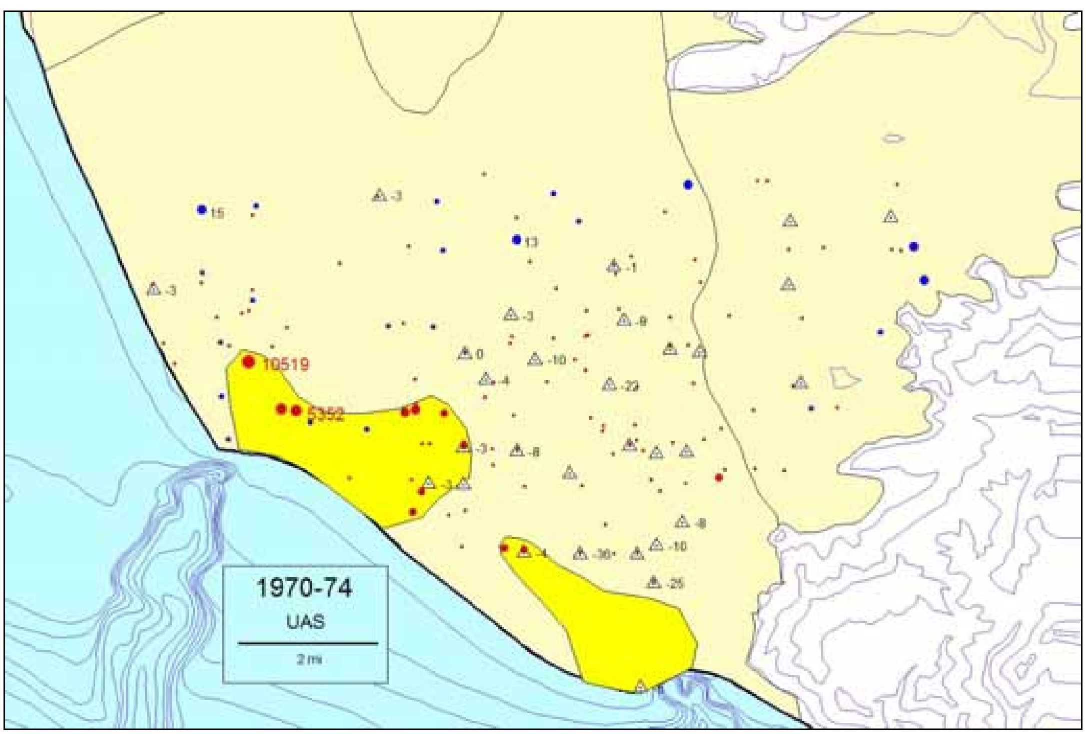

Figure 39. Upper Aquifer System groundwater levels and chloride levels, 1970 to 1974. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

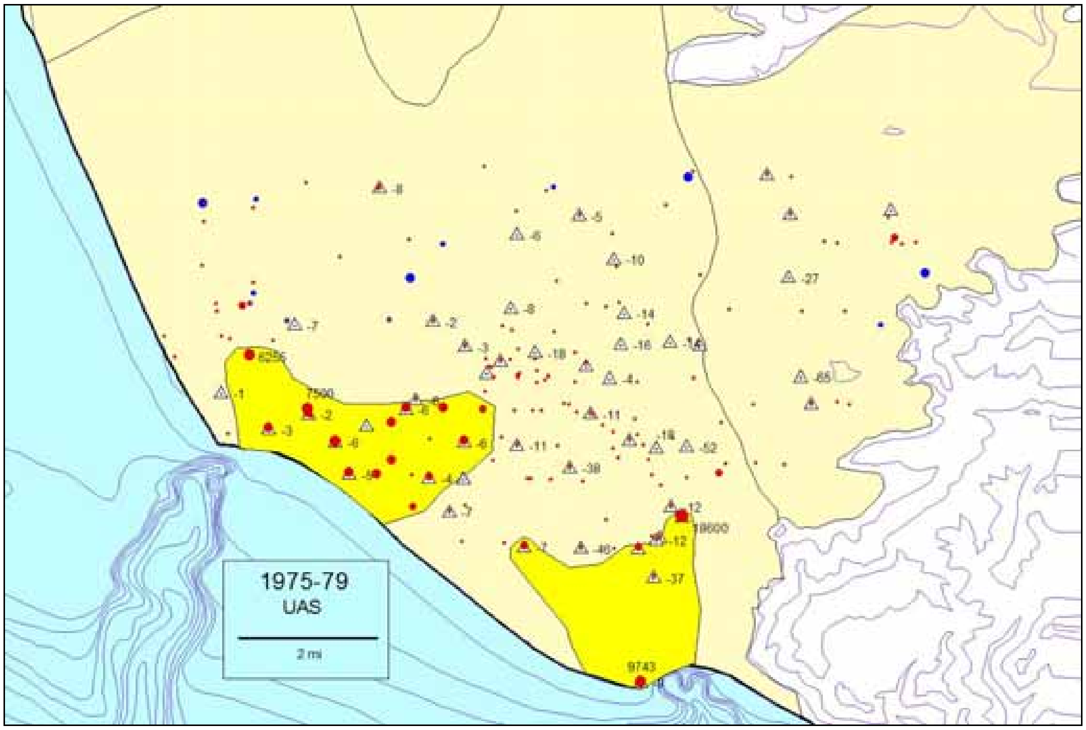

Figure 40. Upper Aquifer System groundwater levels and chloride levels, 1975 to 1979. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

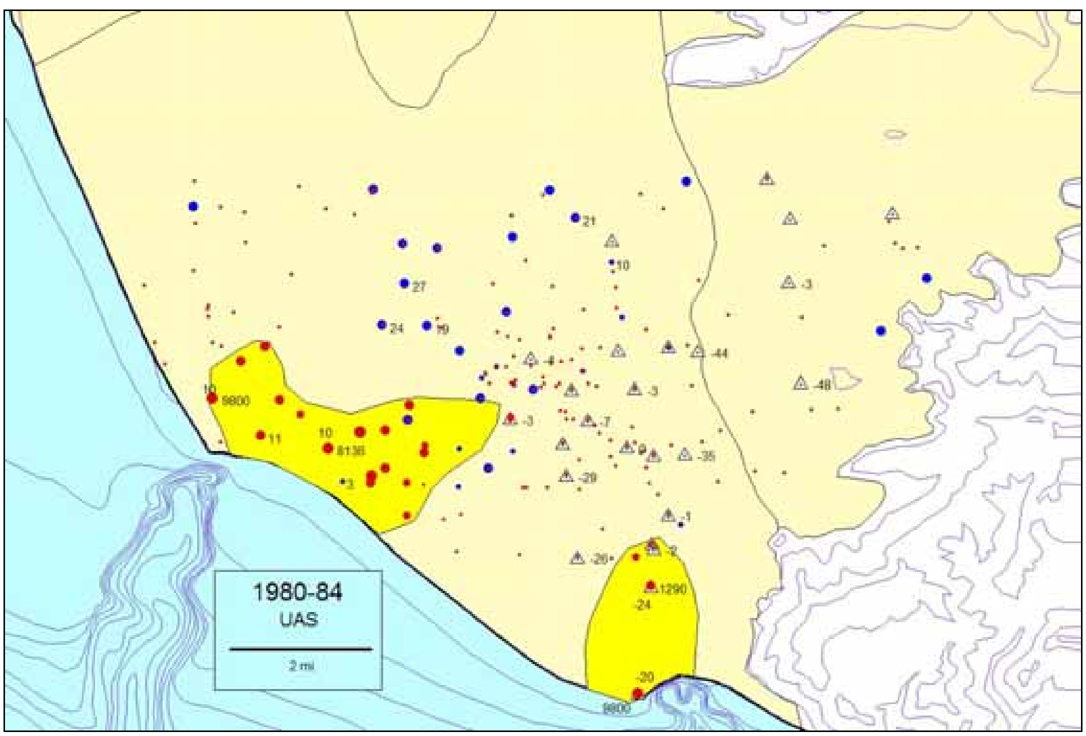

Figure 41. Upper Aquifer System groundwater levels and chloride levels, 1980 to 1984. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

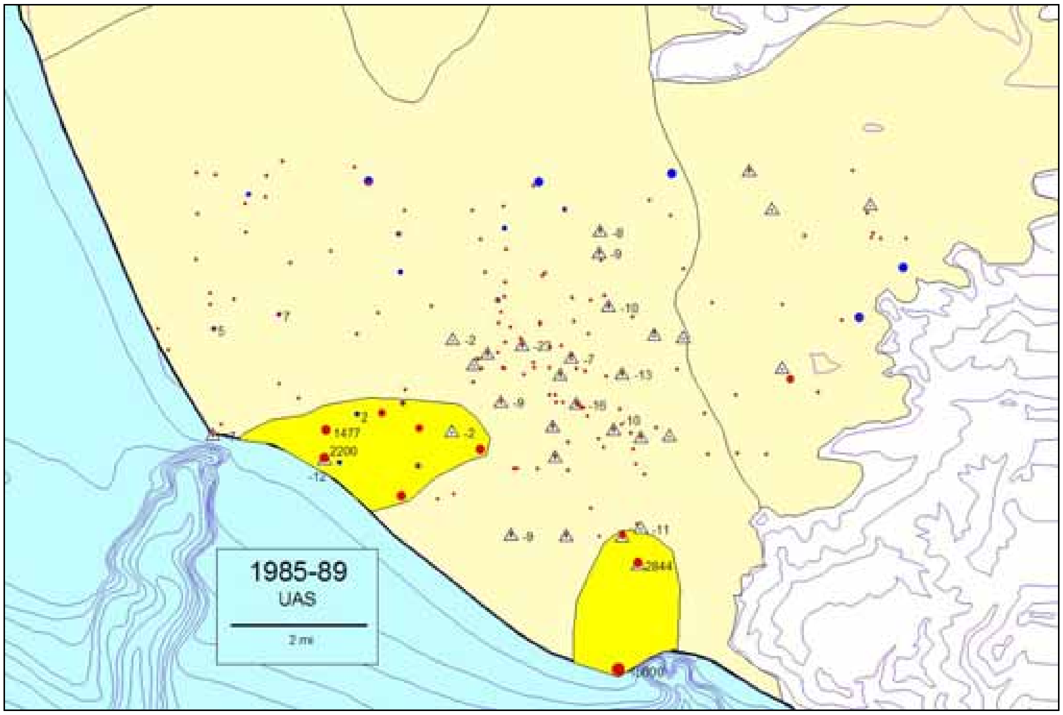

Figure 42. Upper Aquifer System groundwater levels and chloride levels, 1985 to 1989. Legend is shown in Figure 29. Bright yellow areas are intruded by saline waters. Line in title block is two miles in length.

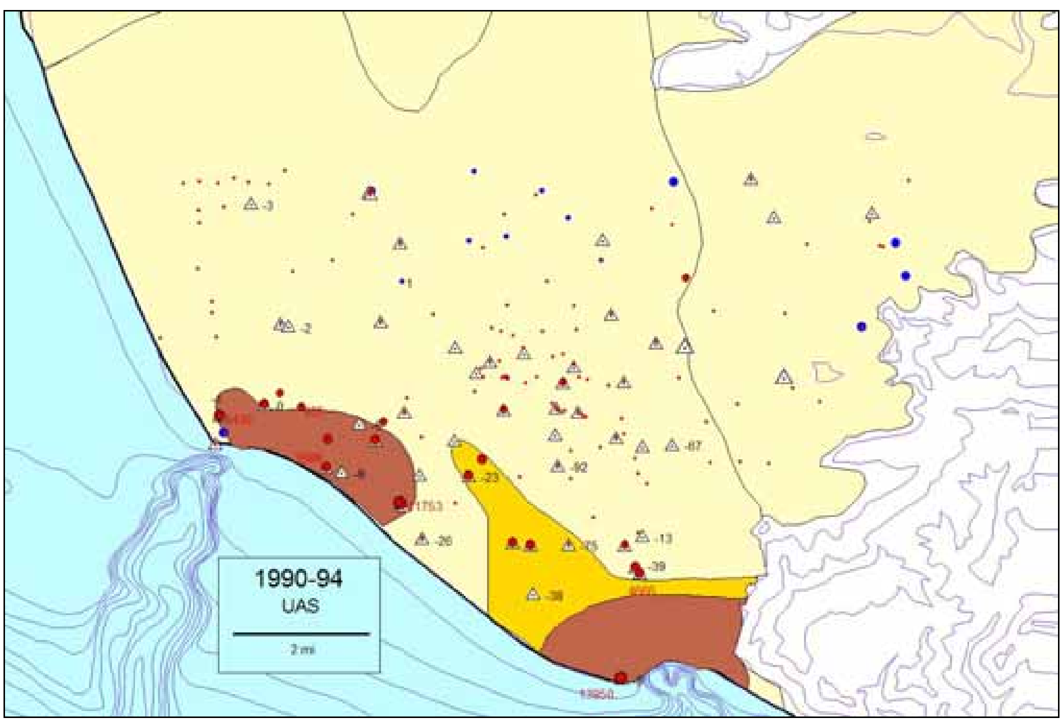

Figure 43. Upper Aquifer System groundwater levels and chloride levels, 1990 to 1994. Legend is shown in Figure 29. Source of saline intruded areas: reddish brown is from seawater; yellow-orange is from sediments. Line in title block is two miles in length.

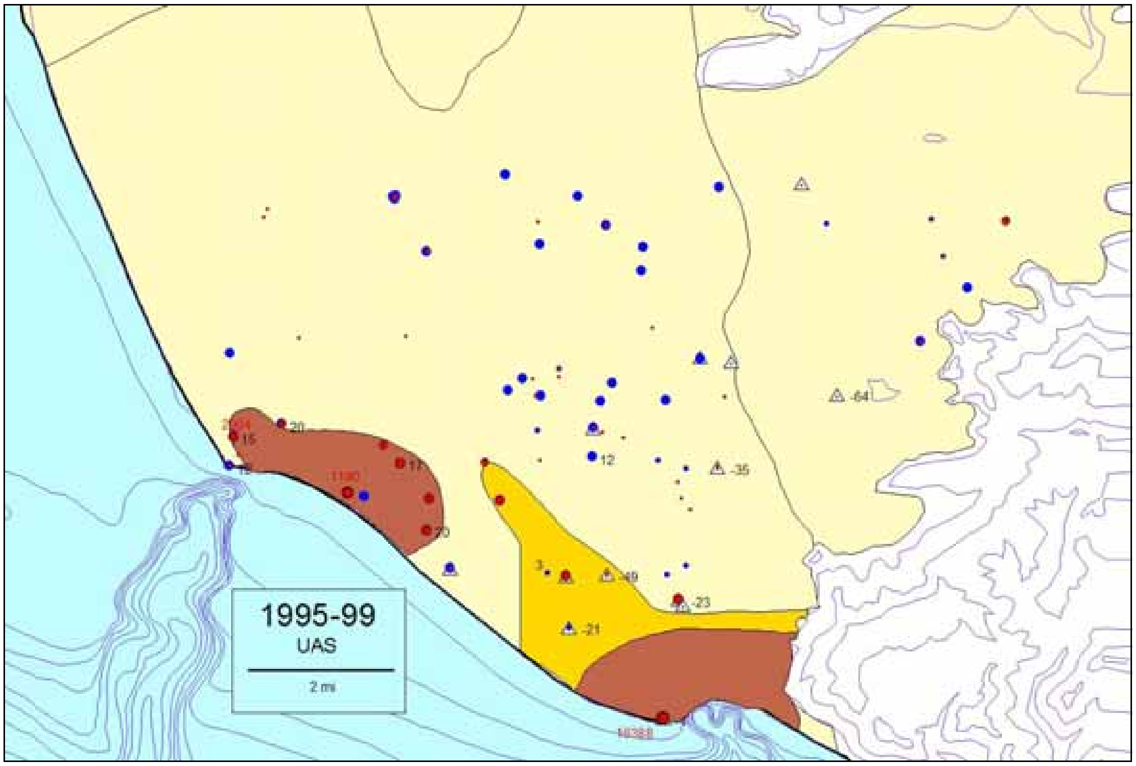

Figure 44 Upper Aquifer System groundwater levels and chloride levels, 1995 to 1999. Legend is shown in Figure 29. Source of saline intruded areas: reddish brown is from seawater; yellow-orange is from sediments. Line in title block is two miles in length.

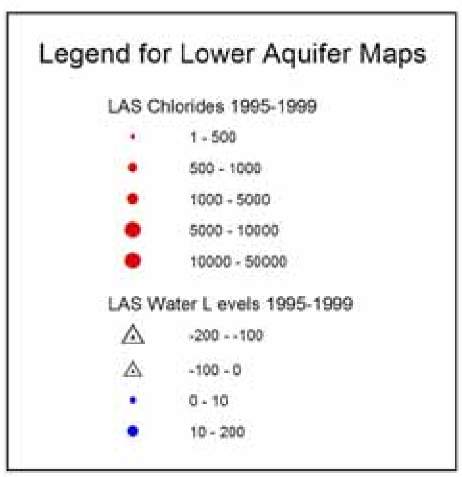

Figure 45. Legend for Figure 46 to Figure 56 for Lower Aquifer System time slices. Chloride concentrations are in mg/L, water level is elevation above or below mean sea level. All maps are

oriented with north to the top of the page. Area of map coincides with location map in Figure 2 in section 2.0 *Background of Groundwater Management and Overdraft Within the FCGMA*.

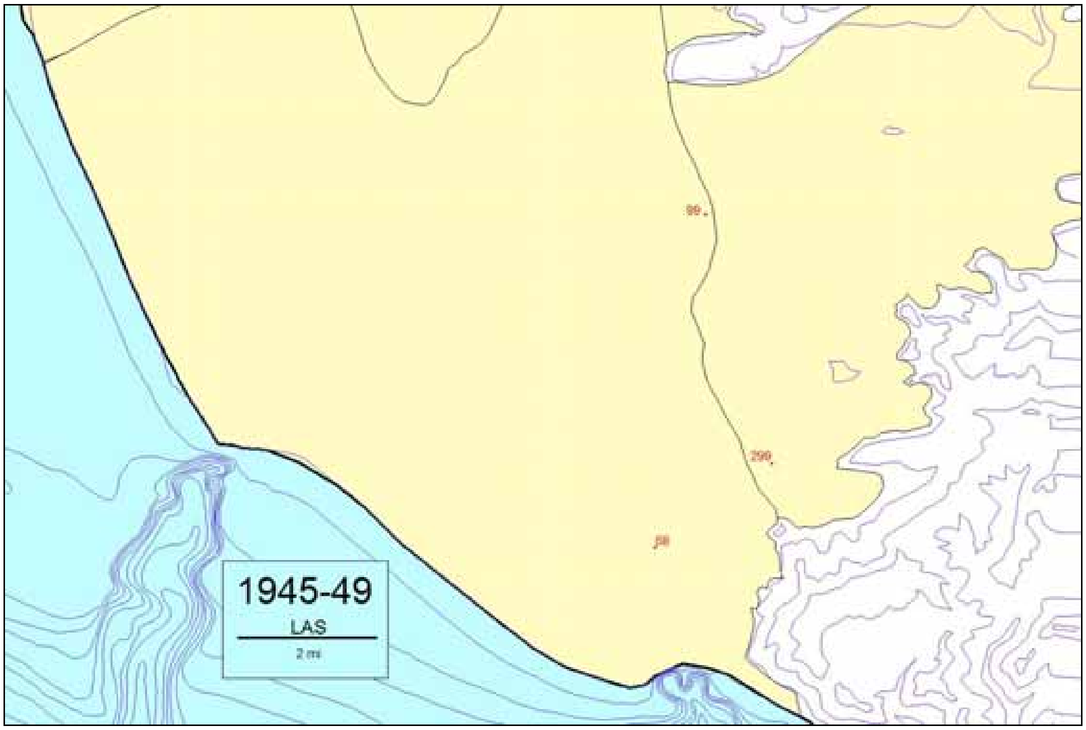

Figure 46. Lower Aquifer System groundwater levels and chloride levels, 1945 to 1949. Legend is shown in Figure 45. Line in title block is two miles in length.

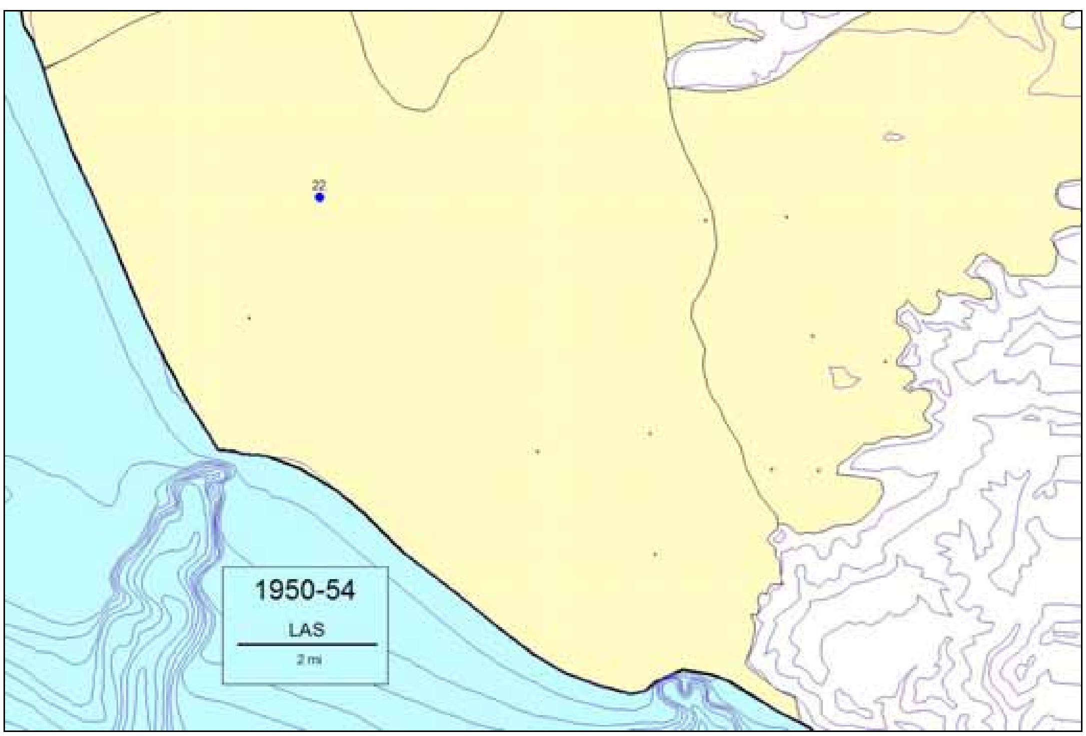

Figure 47. Lower Aquifer System groundwater levels and chloride levels, 1950 to 1954. Legend is shown in Figure 45. Line in title block is two miles in length.

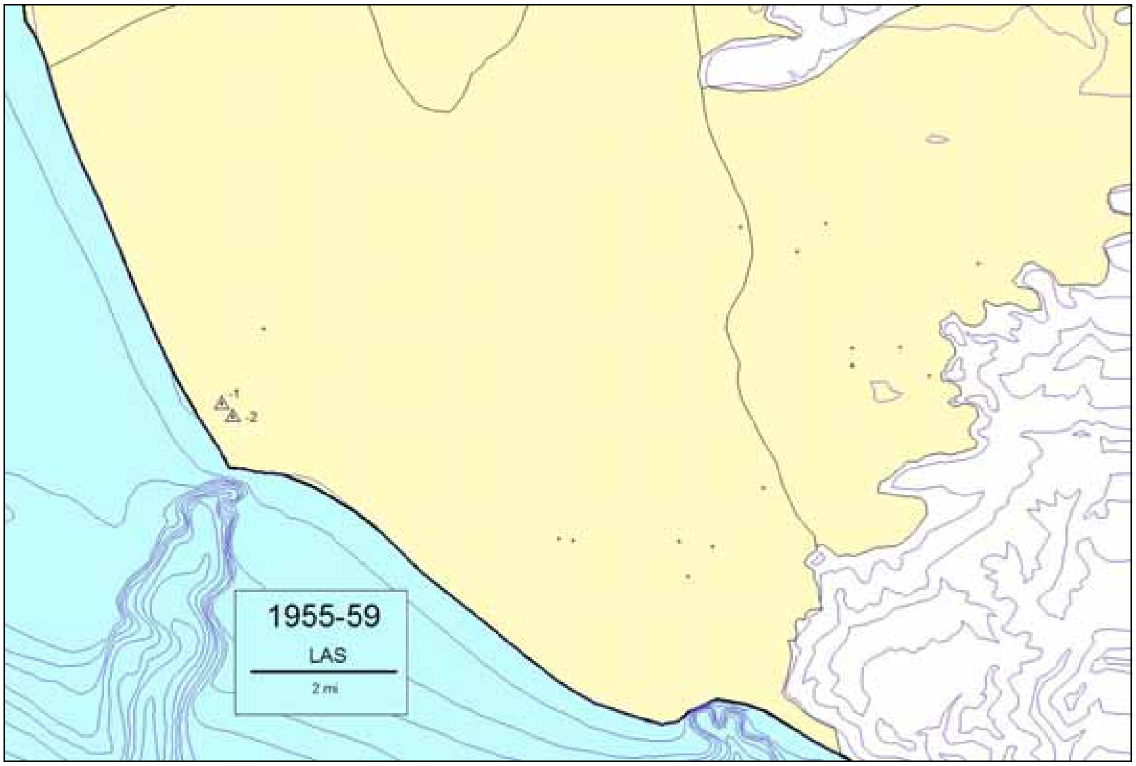

Figure 48. Lower Aquifer System groundwater levels and chloride levels, 1955 to 1959. Legend is shown in Figure 45. Line in title block is two miles in length.

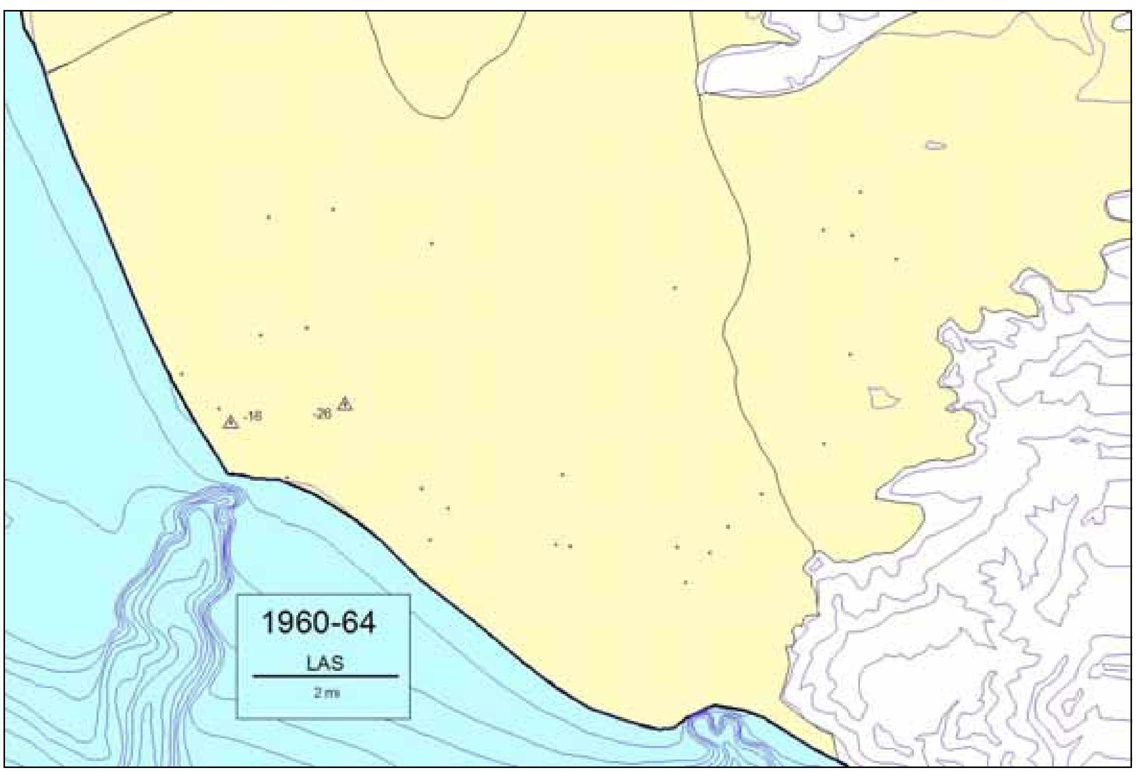

Figure 49. Lower Aquifer System groundwater levels and chloride levels, 1960 to 1964. Legend is shown in Figure 45. Line in title block is two miles in length.

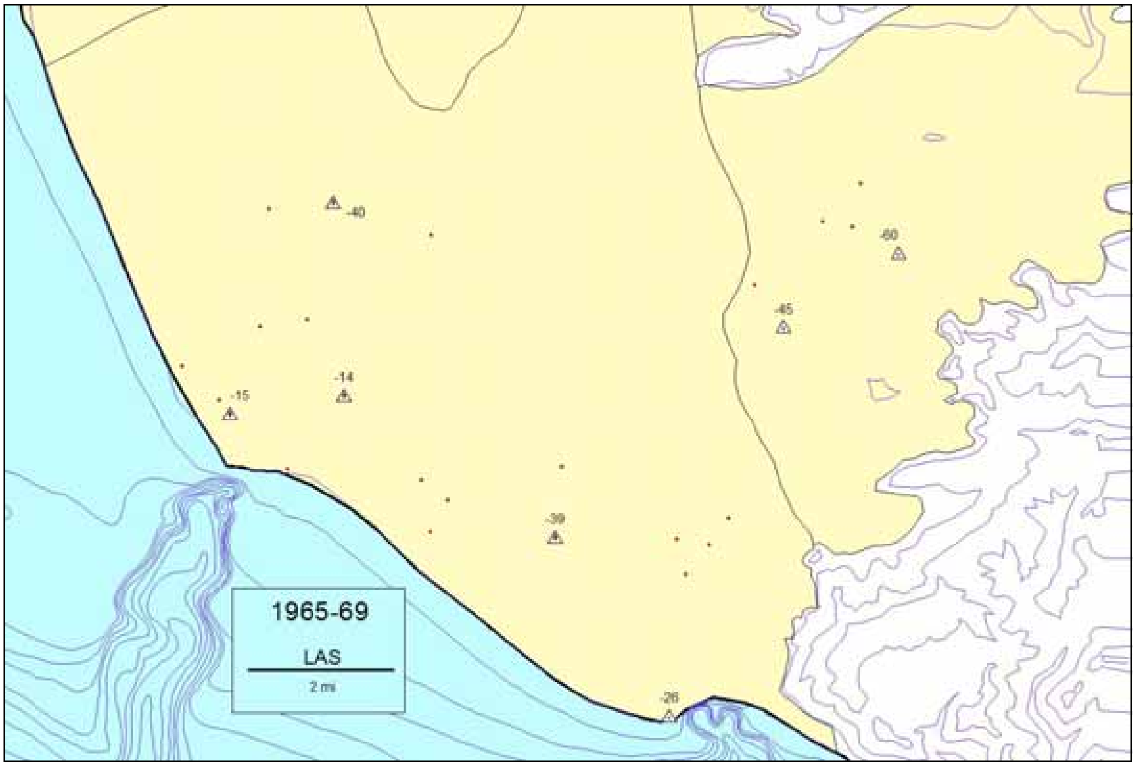

Figure 50. Lower Aquifer System groundwater levels and chloride levels, 1965 to 1969. Legend is shown in Figure 45. Line in title block is two miles in length.

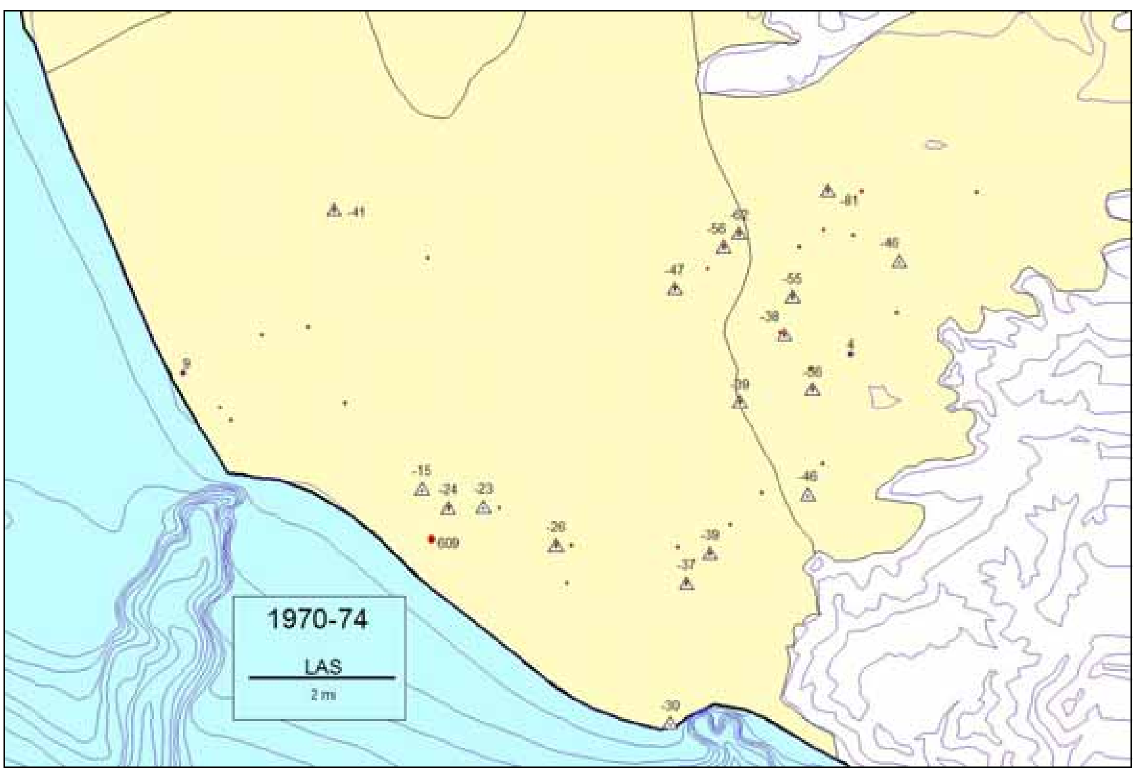

Figure 51. Lower Aquifer System groundwater levels and chloride levels, 1970 to 1974. Legend is shown in Figure 45. Line in title block is two miles in length.

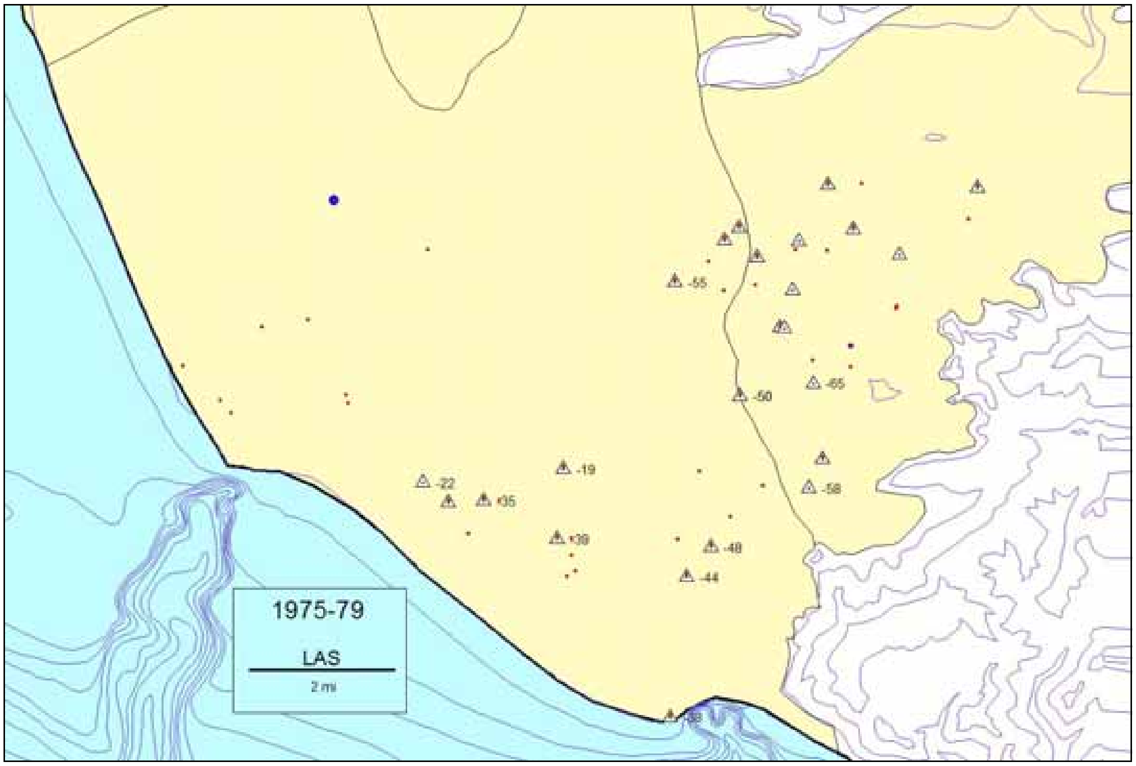

Figure 52. Lower Aquifer System groundwater levels and chloride levels, 1975 to 1979. Legend is shown in Figure 45. Line in title block is two miles in length.

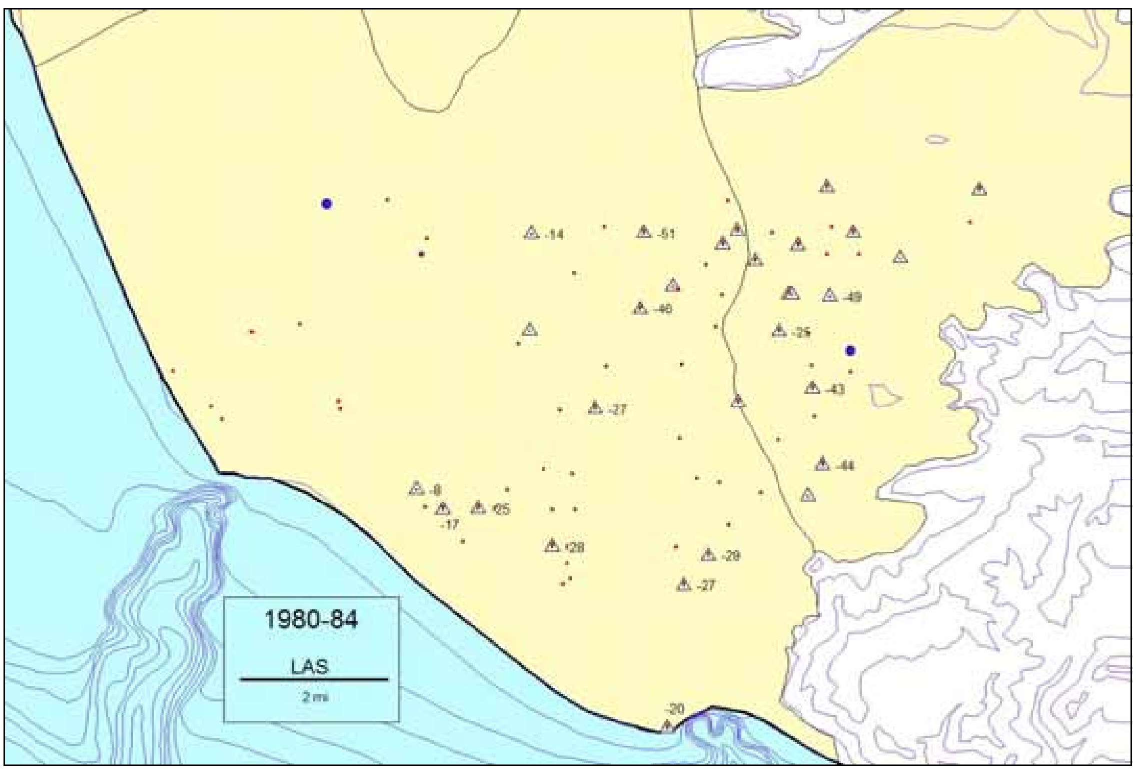

Figure 53. Lower Aquifer System groundwater levels and chloride levels, 1980 to 1984. Legend is shown in Figure 45. Line in title block is two miles in length.

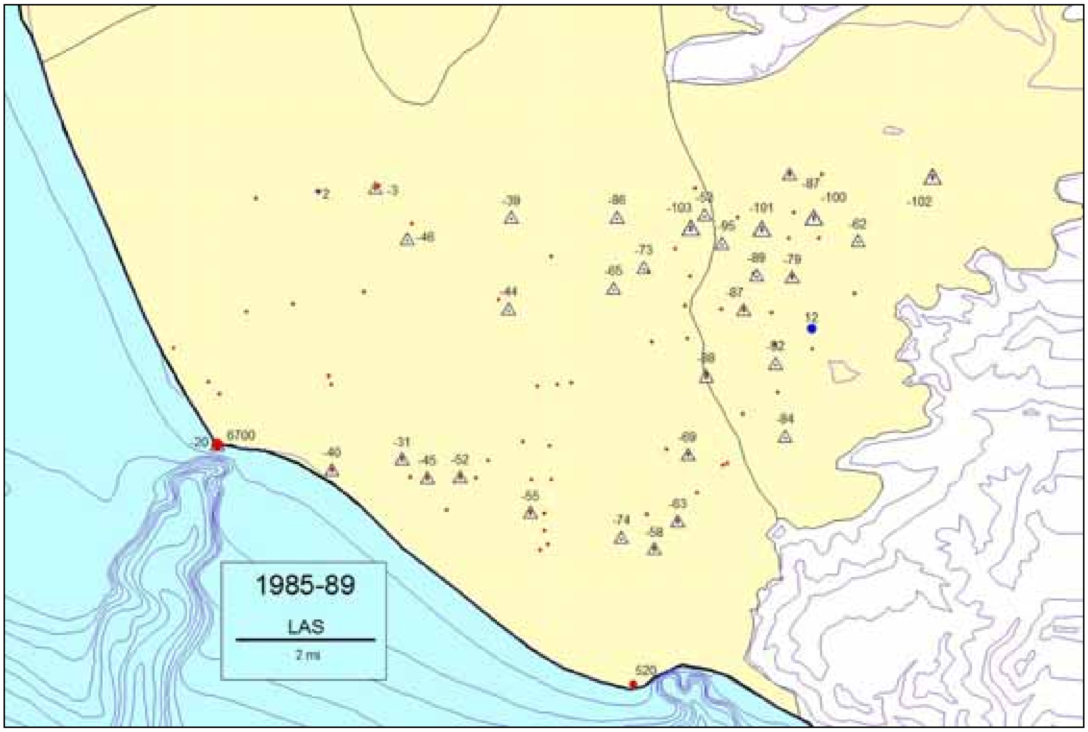

Figure 54. Lower Aquifer System groundwater levels and chloride levels, 1985 to 1989. Legend is shown in Figure 45. Note start of seawater intrusion (red dot) at head of Hueneme Submarine Canyon. Line in title block is two miles in length.

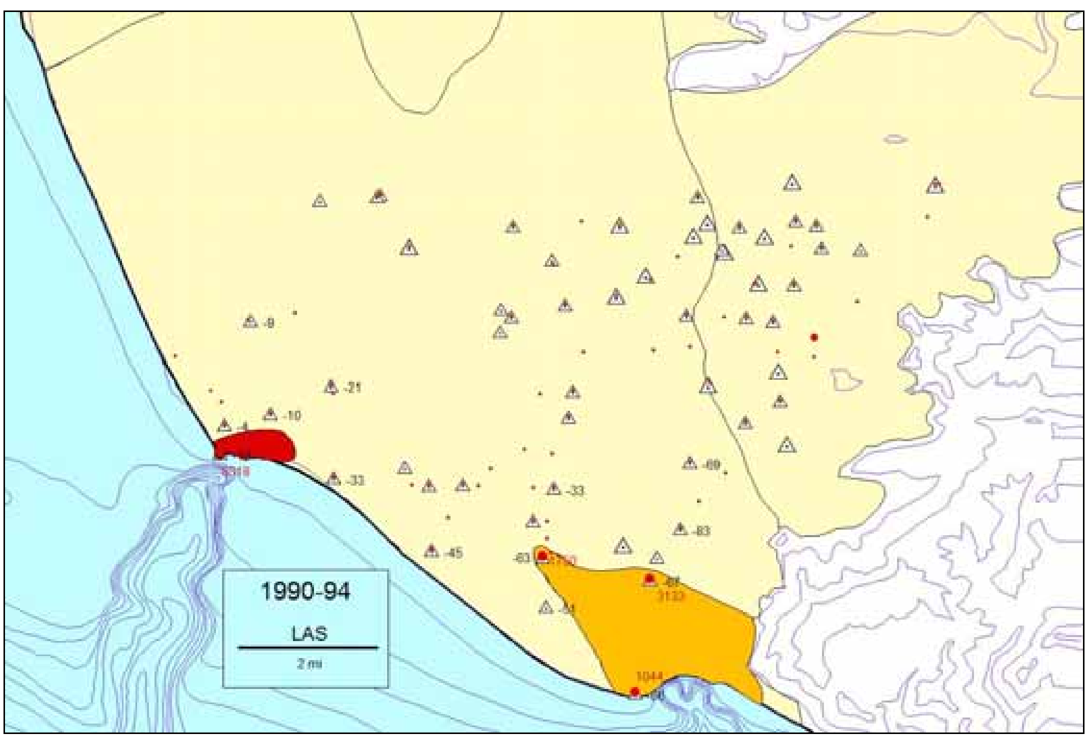

Figure 55. Lower Aquifer System groundwater levels and chloride levels, 1990 to 1994. Legend is shown in Figure 45. Source of saline intruded areas: reddish brown is from seawater; yellow-orange is from sediments. Line in title block is two miles in length.

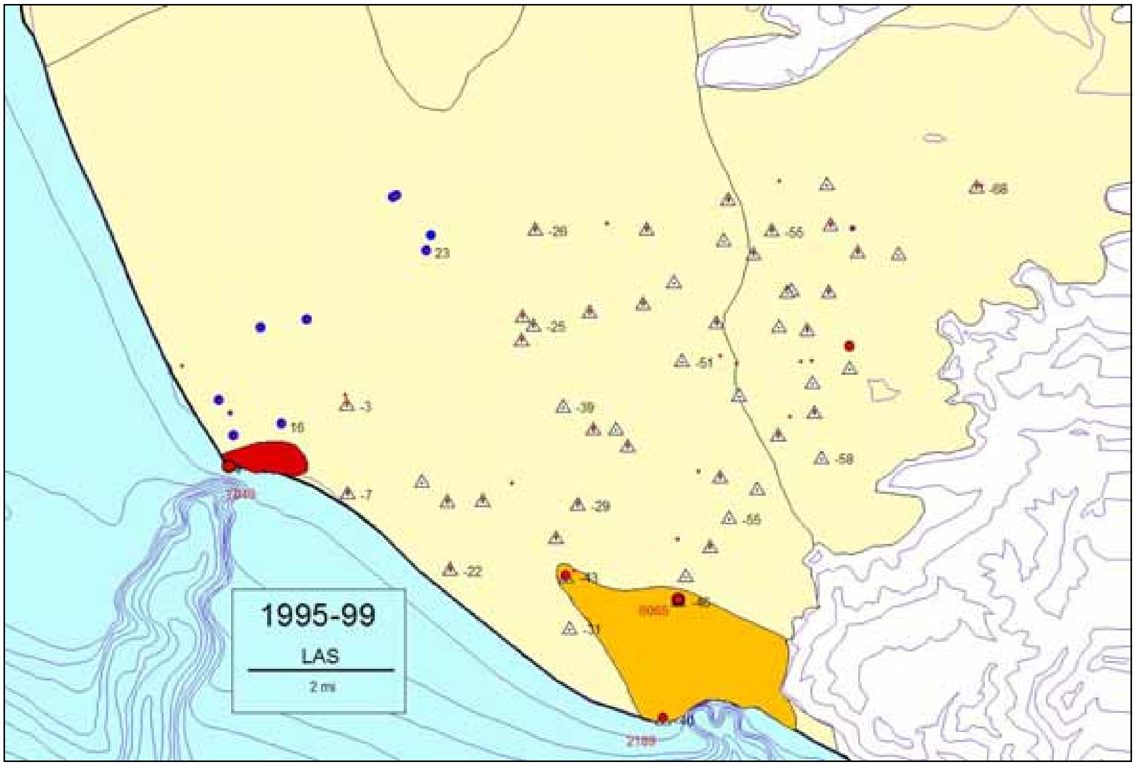

Figure 56. Lower Aquifer System groundwater levels and chloride levels, 1995 to 1999. Legend is shown in Figure 45. Source of saline intruded areas: reddish brown is from seawater; yellow-orange is from sediments. Line in title block is two miles in length.

A2.0 APPENDIX B. - VENTURA REGIONAL GROUNDWATER MODEL

A2.1 INTRODUCTION

The Ventura Regional Groundwater Model is a tool developed to evaluate multifaceted conjunctive use groundwater management projects designed to alleviate seawater intrusion, overdraft, land subsidence and other problems. These projects include in-lieu use of surface water, shifts in pumping and waste water effluent recycling.

The regional groundwater flow model was originally developed by the U.S. Geological Survey (Hanson et al., 2003) as part of the Regional Aquifer Systems Analysis (RASA), jointly funded by United Water Conservation District and Ventura County Water Resources.

The model is a finite difference numerical model which uses the MODFLOW code. The USGS developed an historical model from 1891 to 1993 and a forward model based on 1970 to 1993 hydrology. The original 2 layer model (Upper Aquifer System and Lower

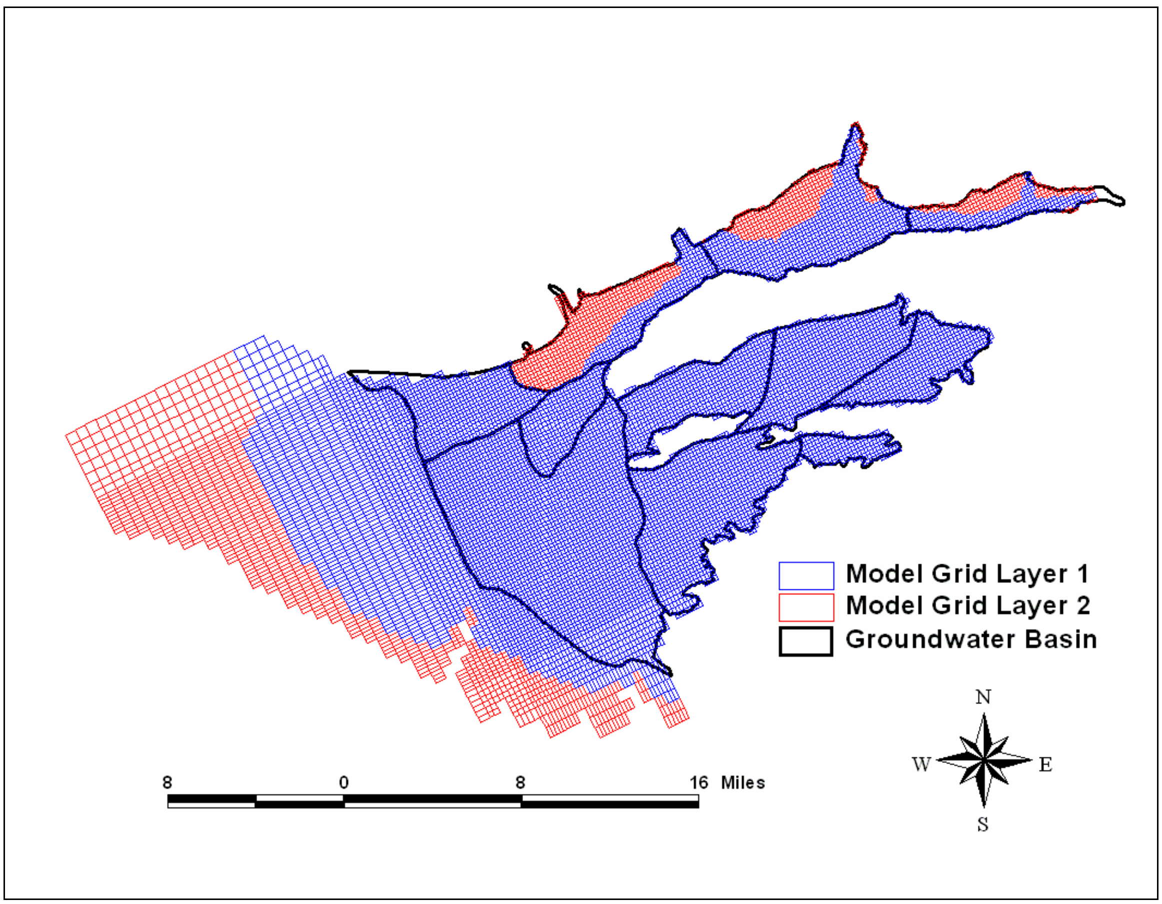

Figure 57. Updated model grid for Ventura Regional Groundwater Model.

Aquifer System) consists of a grid that contains 60 rows and 110 columns for a total of 6,600 cells (Figure 57). Within each cell a groundwater level can be computed. Volume amounts of flow can be computed from cell to cell, basin to basin and from layer to layer. The groundwater basins within the model include Piru, Fillmore, Santa Paula, Mound, Oxnard Plain Forebay, Oxnard Plain, Pleasant Valley, East Las Posas, West Las Posas, South Las Posas, and Santa Rosa.

Water resource inputs to the model include stream flow, artificial recharge, onshore flow, effluent recharge, recharge on permeable mountain front outcrops, rainfall infiltration on the valley floor, and groundwater storage within the permeable sand and gravel aquifers. Water resource outputs include offshore flow and pumping.

The United Water Conservation District has recently modified the groundwater model. The modifications include the following:

- Model was put on user friendly *Groundwater Vistas* platform. This eliminates having to run the model in DOS.
- Refinement of cell size from 1/2 mile x 1/2 mile to 1/6 mile x 1/6 mile for the alluvial basins. This, for example, enables the artificial recharge water to more accurately be input to the appropriate area instead of overlapping into the river.
- Reduction in grid size. In the original USGS model only 28% of the grid cells are active. In the modified model 47% of grid cells are active (ETIC, 2003).
- Extension of the historical and forward model to include 1994 to 2000 hydrology.
- Addition of a zone of lower hydraulic conductivity in the Lower Aquifer System extending in a linear trend from the Camarillo Hills anti-cline to Port Hueneme. This is to simulate the maximum uplift and truncation of the more permeable upper portion of the Lower Aquifer System along this linear trend.
- Addition of an additional layer in the upper basins of Piru, Fillmore, and Santa Paula to better simulate the more permeable alluvium along the Santa Clara River, Sespe Creek, Santa Paula Creek and Piru Creek.
- Recalibration of the Forebay and Oxnard Plain portions of the model over the period 1983 to 1998 to reflect the increased diversions and recharge that have occurred in this area since the USGS originally calibrated the model (UWCD, 2006b).
- Expansion of the forward model period to a full 55 years that reflect the climate and hydrology of the years 1944 to 1998. This period is a commonly-used base period because it starts and ends in very wet years, spans several wet and dry cycles, and represents zero cumulative departure for rainfall across the period.

The regional groundwater flow model has been used in the following projects and analyses:

- Oxnard Plain LAS and UAS overdraft analysis – UWCD (2001)
- GREAT Project EIR – UWCD and City of Oxnard
- Las Posas Basin ASR project operations – Calleguas MWD
- City of Fillmore water supply planning – UWCD and City of Fillmore
- Pleasant Valley AB303 grant study – UWCD
- Fox Canyon Groundwater Management Agency Groundwater Management Plan – UWCD and FCGMA

A2.2 MODELING FOR THE FCGMA GROUNDWATER MANAGEMENT PLAN

The Ventura Regional Groundwater Model was used to evaluate all FCGMA management strategies that change the water budget within the FCGMA – that is, all projects that have recharge and/or groundwater pumping components. The model is a groundwater flow model, not a chemical transport model, so water quality changes could not be directly tested. However, water quality changes could be inferred from the groundwater flows and groundwater elevations in cases such as seawater intrusion – we know how high groundwater elevations need to be at the coastline to prevent seawater from intruding into the aquifers.

The method of evaluation of management strategies was straightforward:

1) First, the forward model was used to determine conditions in the aquifer using only existing strategies and facilities (Base Case).

2) Each strategy was independently added to the Base Case and was run through the forward model (one model run for each strategy). A final model simulation combined all the strategies to determine if together they could solve the overdraft conditions. For ease of evaluation, it was assumed that the new strategy was in place at the beginning of the model period and remained in place for the entire model period.

3) Groundwater elevation results for all the time steps within the forward model were extracted for each of the wells for which there are water-level BMOs. Water levels at the BMO wells were compared between the Base Case and the individual management strategy to determine the effect of the strategy in meeting water-level BMOs.

A2.2.1 Base Case

The Base Case included strategies and facilities currently in place. Although the hydrology of the 55 years of the forward model is based on historical data, several other model inputs are different than they were during the historic period. For instance, the Freeman Diversion allows greater diversions now than were possible before it was constructed; these additional diversions are factored into the forward model. Likewise, groundwater extractions have been reduced during the past 15 years and the forward model must reflect these changes. To calculate the correct extractions for the forward model, the 55-year period was divided into dry, average, and wet years depending upon historical rainfall and stream flow for each model year. There were roughly equal numbers of dry, average, and wet years in the model. Representative data for dry, average, and wet years were used to approximate pumping during the model period; the representative pumping included only the previous 15 years since FCGMA pumping has been reduced and was adjusted to reflect the current 15% FCGMA pumping reduction. The average pumping over the 55-year period of the forward model was calculated to be equivalent to the actual average pumping of the past 15 years (adjusted for FCGMA pumping reductions).

The Base Case does not include potential future changes in pumping or recharge – it represents today's social, economic, and water use conditions, but tests the status quo over a range of hydrologic conditions. In this manner, various groundwater management strategies can be modeled and compared to the Base Case <u>with no other changing conditions</u> to complicate the comparison. Additional model simulations could factor in such changes as potential land use conversion (e.g., agriculture to urban), but it is appropriate to have these model simulations separate from the Base Case.

The Base Case is the starting point for each of the management strategies that were evaluated with the model. Each simulation discussed below simply adds the new management strategy to the Base Case for comparison. The only exception is the Combined Strategies simulation, where all the modeled strategies are combined in a single simulation.

Base Case Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg (ft msl)	5.3	17.6
Base Case		
Avg (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%

Table 10. Results of Base Case groundwater model simulation. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.2 Sensitivity Analysis – Understatement of Reported Extractions

Concerns have been voiced that pumping reported to the FCGMA may be understated by agricultural irrigators because of either poorly-calibrated water meters or inaccuracies in using other reporting methods. To test the effect of understated pumping on modeling results, the Base Case was modified to increase agricultural pumping by 15% during all hydrologic conditions (i.e., wet, average, and dry model years). This modified simulation yielded lower groundwater levels, as would be expected (Table 11).

Pumping Sensitivity Analysis	***Upper Aquifer***	***Lower Aquifer***
Change in Avg BMO Water Levels (ft)	-7.3	-15.0
Change in % of Time Above BMO	-9%	-3%

Table 11. Change in model results for the Base Case if actual agricultural pumping was increased by 15%. The negative changes indicate that groundwater levels would be lower at BMO wells and the percentage of time that groundwater levels were above BMOs would be less.

The sensitivity analysis indicates that the Base Case modeling results may be overestimating future groundwater levels. However, if the model was recalibrated in the future to correct for any understatement of pumping, it is likely that the results would not look much different than the present Base Case. This would happen because if pumping was increased over the calibration period, then this pumping must be balanced by additional recharge that has not been accounted for. If the re-calibrated model has more recharge, then the increased pumping that would be added to the Base Case would potentially be offset by this increased recharge.

The main conclusion to be drawn from the sensitivity analysis is that the current management strategies for the basin may not be as effective as modeled, but not by any amount that would change conclusions of this Plan. More management strategies are still required, and because most of the modeling effort compares one strategy against another (a comparative rather than an absolute analysis), errors will be relatively small. However, if the meter calibration effort planned by the FCGMA proves that there is indeed understating of pumping, the model should be recalibrated to ensure that errors are marginalized.

A2.2.3 Continuation of 25% Pumping Reduction

This simulation compares attainment of BMOs between current 15% pumping reduction and full 25% pumping reduction. The 15% pumping reduction is the Base Case for the model. Thus, an additional 10% pumping reduction is applied for this comparison simulation. This reduction is applied only to M&I wells because agricultural wells have already taken actions that have reduced pumping in excess of 25% and it is unlikely that any additional steps in changing irrigation methods will be undertaken before the 2010 date for full implementation of the 25% pumping reductions. .

Pumping for each M&I well in the model is reduced by an additional 10% for the complete model period. This results in 3,800 AFY of reduced pumping across the FCGMA.

The results of this simulation are indicated in Table 12.

25% Reduction Evaluation	*Upper Aquifer*	*Lower Aquifer*
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
25% Pumping Reduction		
Avg Level (ft msl)	4.9	-37.8
Improve from Base Case (ft)	1.2	2.2
% of Time Above BMO	53%	7%

Table 12. Results of groundwater model simulation for the continuation of the 25% FCGMA pumping reduction. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.4 RiverPark Recharge Pits

Compares attainment of BMOs between current recharge operations (Base Case) and the addition of the RiverPark Recharge pits. Using UWCD's daily river routing model, available storm flow that is not already diverted by the Freeman Diversion is diverted to the RiverPark Recharge Pits for percolation and recharge. This additional recharge is generally only available during the winter and spring of wetter years when river flow exceeds UWCD's current recharge capabilities. The amount of recharge water applied in any one quarter to the model for the RiverPark pits is calculated in daily increments through the river routing model, and takes into account both water availability and recharge capacity in the pits. The extra recharge varies from an average of 400 AFY in dry years to an average of 11,500 AFY during wet years.

The results of this simulation are indicated in Table 13.

RiverPark Recharge Evaluation	*Upper Aquifer*	*Lower Aquifer*
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
RiverPark Recharge		
Avg Level (ft msl)	3.7	-40.0
Improve from Base Case (ft)	<0.1	<0.1
% of Time Above BMO	52%	6%

Table 13. Results of groundwater model simulation for the RiverPark Recharge project. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.5 GREAT Project

This simulation compares attainment of BMOs between current basin operations (Base Case) and the addition of the GREAT project. This simulation was performed in two parts to reflect the two phases of the project that were evaluated in the City of Oxnard's EIR for the project. Although the project phases are in reality scheduled sequentially, the model simulates each phase separately to determine the effectiveness of each. For model purposes, Phase I includes 5,000 AFY of reclaimed water, with one fourth of the water being injected in the Ocean view area of the south Oxnard Plain during the first quarter of each year when agricultural demand is low, and three fourths of the water delivered to agricultural irrigators within the PTP service area in-lieu of pumping their own wells. The City of Oxnard then retrieves the 5,000 AFY of injection/in-lieu recharge (as storage credits) equally from UWCD's O-H well field in the Oxnard Plain Forebay and the City's Water Yard wells located just outside the Forebay.

The Phase II model simulation includes 21,000 AFY of reclaimed water delivered in the same proportions between direct injection and in-lieu deliveries. However, the area receiving reclaimed water for irrigation is expanded to include the Pleasant Valley County Water District delivery area. In addition, the winter injection is accomplished through a series of barrier wells located along Highway 1 and Hueneme Road. The City of Oxnard then retrieves one-third of the 21,000 AFY of injection/in-lieu recharge (as storage credits) from UWCD's O-H well field in the Oxnard Plain Forebay and two-thirds from the City's own wells located just outside the Forebay.

Phase I Results: The results of this simulation are indicated in Table 1. The 8-foot improvement in Lower Aquifer groundwater levels at BMO wells is partially offset by the drop of less than one foot in Upper Aquifer BMO wells. The average drop in groundwater levels in the Oxnard Plain Forebay basin resulting from the extraction of the FCGMA credits is 2 to 3 feet.

GREAT Project Phase I Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
GREAT Project Phase I		
Avg Level (ft msl)	3.4	-31.9
Improve from Base Case (ft)	-0.3	8.1
% of Time Above BMO	51%	9%

Table 1. Results of groundwater model simulation for Phase I of the GREAT project at full capacity. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

Phase II Results: The results of this simulation are indicated in Table 15. The 38-foot improvement in Lower Aquifer groundwater levels at BMO wells is partially offset by the one-foot drop in Upper Aquifer BMO wells. The average drop in groundwater levels in the Oxnard Plain Forebay basin resulting from the extraction of the FCGMA credits is 6 to 11 feet.

GREAT Project Phase II Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
GREAT Project Phase II		
Avg Level (ft msl)	2.6	-1.5
Improve from Base Case (ft)	-1.1	38.5
% of Time Above BMO	51%	36%

Table 15. Results of groundwater model simulation for Phase II of the GREAT project at full capacity. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.6 Shift Some Pumping From LAS to UAS

This simulation compares attainment of BMOs between current basin operations (Base Case) and the shifting of some pumping from the Lower Aquifer back to the Upper Aquifer in critical areas. For purposes of the model scenario, pumping is shifted only in the area of the Oxnard Plain basin where Lower Aquifer groundwater levels are well below sea level (southwest of the zone of low conductance that extends from the Camarillo Hills to Port Hueneme). Actual FCGMA policy might vary from this, but the model run demonstrates the effect of this policy change in a discrete area. In the simulation, 5,000 AFY of Lower Aquifer System pumping is moved to nearby Upper Aquifer System wells (or new UAS wells if necessary). There is no shift in pumping in areas where UAS water quality is not suitable for irrigation.

The results of this simulation are indicated in Table 16.

LAS to UAS Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
LAS to UAS Shift		
Avg Level (ft msl)	2.6	-31.8
Improve from Base Case (ft)	-1.1	8.2
% of Time Above BMO	50%	9%

Table 16. Results of groundwater model simulation for shifting 5,000 AFY of pumping from the Lower to the Upper Aquifer in the south Oxnard Plain basin. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.7 Import Additional State Water

This scenario compares attainment of BMOs between current basin operations (Base Case) and the purchase and recharge of additional State Water. For the purposes of this model simulation, an additional 10,000 AF of State Water is purchased during average and dry years, delivered to Lake Piru, and then released down the Santa Clara River as part of UWCD's normal conservation release. The portion of this water that is likely to reach the Freeman Diversion, as calculated separately using UWCD's daily river routing model, is then diverted at the Freeman Diversion and recharged in UWCD's spreading ponds in the Oxnard Plain Forebay basin.

The results of this simulation are indicated in Table 17. Average groundwater levels in the Oxnard Plain Forebay basin would be 4 to 6 ft higher than the Base Case, providing mitigation for other strategies that have a component of pumping additional groundwater from the Forebay.

Import State Water Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
Import SWP		
Avg Level (ft msl)	5.5	-38.7
Improve from Base Case (ft)	1.8	1.3
% of Time Above BMO	54%	7%

Table 17. Results of groundwater model simulation of importing additional State Water. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.8 Increase Diversions from Santa Clara River

This simulation compares attainment of BMOs between current basin operations (Base Case) and increasing recharge from the Santa Clara River during periods of high storm flow. For purposes of this model simulation, it is assumed that the diversion rate and license of the Freeman Diversion is increased to 1,000 cfs from its current 375 cfs. Thus, during times of high flow, up to 1,000 cfs could be diverted. These additional diversions are recharged at UWCD's facilities according to their unused capacity, as determined by UWCD's daily river routing model. For purposes of the model scenario, it is assumed that the RiverPark recharge facility is available and that the Ferro gravel pit has been converted to use for recharge and storage.

The results of this simulation are indicated in Table 18. Average groundwater levels in the Oxnard Plain Forebay basin would be 6 ft higher than the Base Case, providing mitigation for other strategies that have a component of pumping additional groundwater from the Forebay.

Increase Diversions Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
Increase Diversions		
Avg Level (ft msl)	6.4	-37.4
Improve from Base Case (ft)	2.7	2.6
% of Time Above BMO	54%	8%

Table 18. Results of groundwater model simulation for increasing diversions from the Santa Clara River. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.9 Additional In-Lieu Deliveries to South Oxnard Plain

This model scenario compares attainment of BMOs between current basin operations (Base Case) and the delivery of additional in-lieu recharge water to the south Oxnard Plain. For purposes of this model simulation, it is assumed that there are 3,000 AFY of in-lieu water available for delivery to irrigation irrigators in the area south of the end of the PTP Pipeline. This in-lieu water delivery is adjusted for changes in quarterly agricultural demand.

The results of this simulation are indicated in Table 19.

In-Lieu S Oxnard Plain Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
In-Lieu S Oxnard Plain		
Avg Level (ft msl)	4.9	-35.9
Improve from Base Case (ft)	1.2	4.1
% of Time Above BMO	53%	7%

Table 19. Results of groundwater model simulation of delivering additional in-lieu water to pumpers on the southern Oxnard Plain basin. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.10 Shift Some Pumping to Northwest Oxnard Plain

This simulation compares attainment of BMOs between current basin operations (Base Case) and shifting some pumping to the northwest Oxnard Plain from areas less easily recharged. For this model simulation, it is assumed that 2,000 AFY of M&I pumping is moved from the portion of the Oxnard Plain near the Forebay basin to the northwest Oxnard Plain. This pumping is shifted from the City of Oxnard's Water Yard and Blending Station to the area within 2 miles of the ocean along Gonzalez Rd.

The results of this simulation are indicated in Table 20.

Shift NW Oxnard Plain Evaluation	*Upper Aquifer*	*Lower Aquifer*
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
Shift NW Oxnard Plain		
Avg Level (ft msl)	3.9	-39.7
Improve from Base Case (ft)	0.2	0.3
% of Time Above BMO	51%	5%

Table 20. Results of groundwater model simulation of shifting some pumping to the northwestern portion of the Oxnard Plain basin. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.11 Injection of Treated River Water in Overdrafted Basins

This model scenario compares attainment of BMOs between current basin operations (Base Case) and the injection of treated river water into the south Oxnard Plain and Pleasant Valley areas when there are unused river diversions either during the wet portion of the year or during extended times during very wet years. The rate of injection was varied from 1,500 AFY during dry years to 5,000 AFY during wet years. For purposes of this simulation, it is assumed that the injection sites are located both within the PTP system and the Pleasant Valley CWD service area along the deepest portion of LAS pumping depression.

The results of this simulation are indicated in Table 21.

Injecting River Water Evaluation	*Upper Aquifer*	*Lower Aquifer*
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
Injecting River Water		
Avg Level (ft msl)	5.0	-32.6
Improve from Base Case (ft)	1.3	7.4
% of Time Above BMO	53%	11%

Table 21. Results of groundwater model simulation of injecting treated river water in the south Oxnard Plain and Pleasant Valley areas. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.12 Switch Location of City of Camarillo Pumping

To test the effectiveness of moving pumping from near the Camarillo airport to an area along the Arroyo Las Posas (see section 9.3 *Development of Brackish Groundwater, Pleasant Valley Basin*), the pumping from the airport well was eliminated for the model simulation. Model results indicate that the worst portion of the pumping depression would be decreased considerably in size, leaving a smaller depression in the southern Pleasant Valley basin (Figure 58).

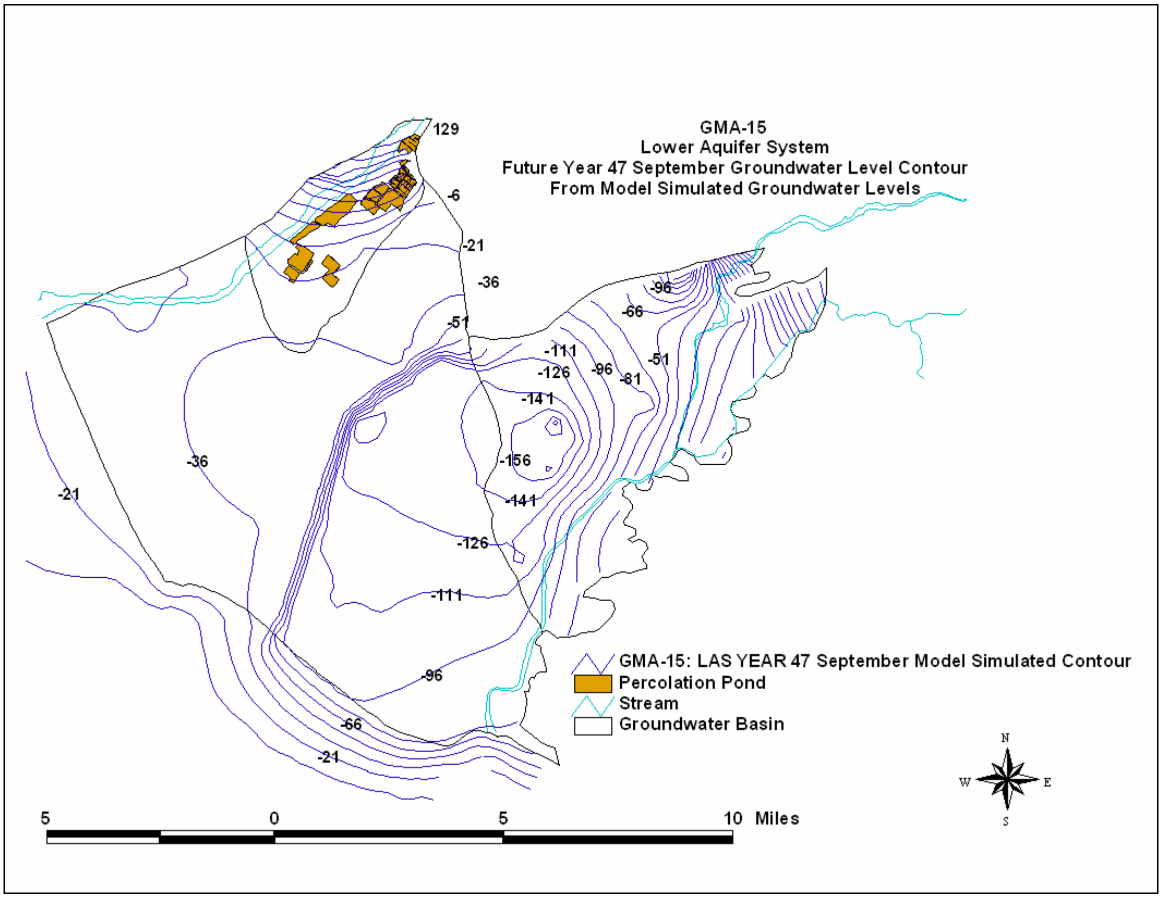

Figure 58. Simulated groundwater elevations for the LAS during the model year corresponding to the 1990 drought year, when the pumping trough beneath Pleasant Valley and the south Oxnard Plain was most pronounced. The elimination of pumping from the City's airport well decreased the size of the northern portion of the pumping depression.

A2.2.13 Full-Time Barrier Wells in South Oxnard Plain

This simulation compares attainment of BMOs between current basin operations (Base Case) and the use of barrier wells in the south Oxnard Plain to build a recharge mound that prevents coastal chloride contamination from moving further inland. The effectiveness of barrier wells was partially tested for the GREAT project. This simulation assumes that there is water available during the entire year for injection – the actual water available would likely be a combination of recycled water and other water sources. To dovetail with the GREAT simulation's winter-only injection scenario, the water available for injection in the barrier wells was modeled at 21,000 AFY, which was injected at a constant rate throughout the year. The barrier wells used in the simulation are identical to the locations of the GREAT Phase II barrier wells along Highway 1 and Hueneme Road.

The results of this simulation are indicated in Table 22.

Barrier Wells Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
Barrier Wells		
Avg Level (ft msl)	15.2	6.5
Improve from Base Case (ft)	11.5	46.5
% of Time Above BMO	63%	48%

Table 22. Results of groundwater model simulation for a barrier well project in the south Oxnard Plain. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A2.2.14 Combined Management Strategies

The management strategies used in the previous simulations were combined in a single model run to determine their overall combined effect in reaching BMOs. This model simulation is an indicator of whether additional management strategies are needed beyond those in this Plan.

The results of this simulation are indicated in Table 23. The most important result is that the combined management strategies allow BMOs to be met 67% of the time in the Upper Aquifer and 76% of the time in the Lower Aquifer. This result suggests that if all the management strategies in the Plan are implemented, the basin would be relatively safe from saline intrusion (see discussion in section 7.0 *Yield of the Groundwater Basins* on level of attainment of BMOs).

Combined Strategies Evaluation	***Upper Aquifer***	***Lower Aquifer***
BMO Avg Level (ft msl)	5.3	17.6
Base Case		
Avg Level (ft msl)	3.7	-40.0
% of Time Above BMO	51%	5%
Combined Strategies		
Avg Level (ft msl)	18.4	59.8
Improve from Base Case (ft)	14.7	99.8
% of Time Above BMO	67%	76%

Table 23. Results of groundwater model simulation of implementing the combination of all the management strategies evaluated using the groundwater model. Groundwater elevations are averages for Upper and Lower Aquifer wells for which there is a groundwater elevation BMO. Also indicated is the percentage of time (weekly time steps) that groundwater elevations were above the BMO elevation for each BMO well.

A3.0 APPENDIX C. EAST LAS POSAS BASIN MANAGEMENT PLAN

During the February 23, 1994 meeting, the Board of Directors of the FCGMA conditionally approved CMWD's Application for the Injection/Storage Facilities in the North Los Posas Basin. (**Note:** The reference to the North Las Posas Basin stems from the FCGMA original Groundwater Management Plan adopted in 1985. The current correct reference is the East Las Posas Basin).

This approval was conditioned upon several factors including but not limited to: (1) a maximum of 20 injection/storage wells registered with the FCGMA; (2) well injection/extraction schedule determined by availability of water and needs of CMWD's customers; (3) continuous injection period well testing and monthly reporting of acre-feet injected/extracted from wells along with water quality analysis for selected constituents to the FCGMA by CMWD; (4) maximum storage limit of 300,000 acre-feet without further approval of the FCGMA; (5) extraction/injection points shall be coterminous, or in proximate vicinity and coordinated with the FCGMA; (6) water stored in such facilities shall be used in Ventura County; (7) CMWD periodic review of the effects of the injection on surrounding basins to ensure no detrimental effect; (8) CMWD shall have an affirmative obligation to mitigate any detrimental effects found; and (9) FCGMA approval standards for the injection/storage wells shall be mandatory. These conditions were memorialized in a July 12, 1994 letter from Lowell Preston, Ph.D., Agency Coordinator, to Eric Berg, Administrator, CMWD (See Appendix C - Exhibit A).

Subsequently to FCGMA's above mentioned approval, CMWD engaged in several years of discussions about groundwater issues in the Las Posas basin with members of the East Las Posas Basin Users Group (the Group) and individual pumpers. This informal Group, which meets every second month, discusses both basin-wide groundwater issues and potential issues related to Calleguas' Las Posas Basin ASR project.

As a result of those discussions, CMWD and the Group developed the East Los Posas Basin Management Plan (ELPBMP). The ELPBMP, which outlines a monitoring program for the injection/storage wells, establishes action levels, sets stakeholder responsibilities for operation of the ASR project by CMWD, and provides for a dispute resolution mechanism between the parties, attempts to manage the ASR project in such a way as to minimize problems and maximize the beneficial use of groundwater within the East Las Posas Basin..

The ELPBMP is attached to the FCGMA Management Plan as Appendix C. It is understood by the parties that the East Las Posas Basin Management Plan will be reviewed and updated regularly as conditions warrant it.

The Plan begins on the following page.

EAST LAS POSAS BASIN
MANAGEMENT PLAN

THIS MANAGEMENT PLAN FOR THE EAST LAS POSAS BASIN (the "Plan"**)** is effective as of ______________, 2006, and is created with reference to the following recitals of fact, understandings and intentions:

RECITALS

A. Calleguas Municipal Water District ("Calleguas") operates an Aquifer Storage and Recovery Project ("ASR") for the benefit of its urban, industrial and agricultural water delivery customers in the Las Posas Basin ("Basin") in Ventura County, California.

B. The Basin is identified as a groundwater subsystem within the boundaries of the Fox Canyon Groundwater Management Agency ("GMA").

C. The ASR project stores potable water in the aquifers of the Basin for use during emergencies and drought periods.

D. The Las Posas Basin Pumpers extract groundwater from the Basin for beneficial uses that include agricultural, domestic, urban and industrial uses. The "Las Posas Basin Pumpers" includes members of the Las Posas Basin Users Group and all other persons or entities extracting groundwater from the East Las Posas Basin (within the boundaries of the GMA).

E. Calleguas and the Las Posas Basin Pumpers desire to manage the groundwater basin such that the ASR project and the Las Posas Basin Pumpers' beneficial uses co-exist to the benefit of all.

F. Calleguas has previously entered into an agreement with the GMA for operation of the ASR project ("Calleguas-GMA Agreement"). A copy of the Calleguas-GMA Agreement is attached hereto as Exhibit "A" and incorporated herein by reference. The Calleguas-GMA Agreement describes the general principles within which the ASR project will operate.

G. Pursuant to the Calleguas-GMA Agreement, stored water is credited to the ASR project when Calleguas either injects potable water into the aquifer through wells or when water is delivered by or through Calleguas to the Las Posas Basin Pumpers in lieu of pumping groundwater. The storage credit pursuant to the Calleguas-GMA Agreement remains in the Basin until the stored water is extracted.

H. Calleguas and the Las Posas Basin Pumpers desire to have the GMA incorporate the terms of this Plan into the updated GMA plan.

NOW, THEREFORE, in consideration of the mutual benefits, covenants and promises set forth herein, the Management Plan for the East Las Posas Basin is as follows:

1. **Monitoring Program**. Calleguas will maintain a monitoring program to track changes in groundwater levels and groundwater quality in the Basin. This monitoring program will consist of two parts: (1) a set of four representative key wells spaced throughout the Basin ("baseline key wells") will monitor the overall health of the Basin (Exhibit "B" and identified by State Well number); and (2) a set of monitoring and producing wells on parcels within or adjacent to the ASR project ("local vicinity wells") will monitor the effects of the ASR injection and pumping on the Basin (Exhibit "C").

2. Report of Results of Monitoring Program. Calleguas will report results of the monitoring program described in paragraph 1 above in writing to the Las Posas Basin Pumpers at least every six (6) months during noticed meetings of the Las Posas Basin Users Group. In addition, Calleguas will prepare a written report on ASR activities, monitoring results and the state of the Basin annually, and that report will also be made available to the Las Posas Basin Users Group.

3. Extractions and Storage Credits. Calleguas covenants and promises that it will only extract water consistent with the Calleguas-GMA Agreement and in an amount which does not exceed Calleguas' storage credits in the Basin, as they may exist at any time. Calleguas will apply for storage credits from the GMA annually based on the amount of water injected and in lieu water delivered that year; the GMA will maintain the storage credit balance for the ASR project and will give written notice to the Las Posas Basin Users Group of the amount of those credits annually and provide a report directly to the Las Posas Basin Users Group every six months as to the amount of storage and extractions which have occurred.

4. Operation of ASR Project. Calleguas will operate the ASR project in a manner that does not adversely affect the Basin by creating, by way of example only, chronic declining water levels, increased levels of TDS or chlorides, significant increased pumping lifts, or saline intrusion. It is acknowledged that all currently available information indicates that the Basin may be in overdraft. Although it is not projected that the ASR project will alleviate the overdraft, Calleguas will make a good faith effort to assist the Las Posas Basin Pumpers in reducing the overdraft. Additionally, it is recognized that there is a mound of high-chloride, high-TDS water migrating into the Basin from beneath the Arroyo Las Posas. Calleguas will assist in mitigating this water quality problem by facilitating projects that will pump this poor-quality water, treat it for agricultural and drinking water use and discharge the resulting brine into a regional brine line. To keep Las Posas Basin Pumpers informed of ASR operations, Calleguas will provide a summary sheet of injections and extractions relating to ASR operations at every Las Posas Basin Users Group meeting (held approximately every two months, but no less than 4 times a year). This summary will discuss, among other things, all injection, extraction and in-lieu activities for the two months prior to the meeting. This summary will also be provided to the GMA.

5. Groundwater Levels. Calleguas will operate the ASR project in a manner which will not significantly impact Las Posas Basin Pumpers' ability to use groundwater from the Basin. Impacts will be measured on two levels – basin-wide and local. Basin-wide impacts will be measured using the four baseline key wells. Local impacts will be measured using the local vicinity wells.

Basin-Wide Effects: In order to establish groundwater levels that would exist without the ASR project ("baseline"), the USGS Santa Clara-Calleguas MODFLOW groundwater flow model, as updated by United Water Conservation District and Calleguas, will be used in conjunction with the four baseline key wells. The baseline will be established by running the groundwater model every two years using all available actual pumping and hydrologic data for the period, but excluding any ASR injection/extraction operations or water deliveries in-lieu of injection. The first run of the model for purposes of this Plan will be as follows: The modeled "no ASR project" groundwater levels determined as of September 1, 2006, at the four baseline key wells would establish the baseline for the two-year period. If actual measured water levels fall below the baseline in any of the baseline key wells during the applicable two-year period, then the cause of the groundwater level decline below the baseline will be investigated by Calleguas within 45 days of Calleguas learning of the measured water level falling below the baseline. If the water level drop below baseline is determined to be caused by ASR operations, then Calleguas will present a written plan to the Las Posas Basin Pumpers to mitigate the excess drawdown. That written plan will be presented by Calleguas to the Las Posas Basin Users Group no later than 120 days after Calleguas learns that measured water levels are below baseline.

Local Effects: In the vicinity of the ASR injection/extraction wells, it is recognized that groundwater levels will fluctuate depending upon rates of injection/extraction and proximity to the wells. Nearby wells will see groundwater levels rise and pumping lifts decrease during and following injections of stored water. During extractions of stored water, groundwater levels in the vicinity of the extraction may decrease below levels normally seen in nearby wells, with this pumping effect dissipating when extraction is terminated. Calleguas will use all reasonable efforts to insure that nearby wells can continue to be pumped during this extraction period; if lowered water levels create operational problems such as the inability to pump groundwater because groundwater levels are below pump bowls or the pump breaks suction in any nearby well, Calleguas will attempt to assist well owners in mitigating the problem. Such mitigation measures may include, among other things, providing in-lieu water to well owners at prevailing rates.

6. Disputes. If any dispute arises over the effects of the ASR program and this Plan, the specifics of the dispute will first be presented within 45 days of the dispute arising to an advisory group of members of the Las Posas Basin Users Group numbering not less than 5. If the dispute is not resolved within 45 days after submittal to the advisory group, the dispute shall be presented to Calleguas in writing. Calleguas will then, within 45 days of receiving written notice of the dispute, investigate the issues in the dispute, including performing any hydrogeologic investigation where appropriate. The disputing party will not unreasonably withhold access to historic groundwater data known to the party or access to wells for monitoring. Calleguas will, within 120 days, give a written reply to the disputing party which will include results of any hydrogeologic investigation. In the event that the party is not satisfied by this procedure, the disputing party can deliver a copy of the written dispute to the GMA. If the GMA does not resolve the problem to the satisfaction of the disputing party within 120 days of the delivery of a copy of the written dispute to the GMA, then the disputing party can take whatever legal action it deems appropriate.

7. Term. This Plan shall remain in effect so long as the Calleguas-GMA Agreement remains in effect.

8. Existing Water Rights Unaffected. This Plan and the ASR project shall in no way affect or alter existing water rights in the Basin or grant new or additional water rights to Calleguas or the Las Posas Basin Pumpers (other than the specific rights of injection and extraction granted herein). All injections or extractions are done with the knowledge and consent of the Las Posas Basin Pumpers and under no circumstances will any injections or extractions or pumping under this Plan ripen into a claim for prescriptive or superior rights.

9. Condition of Basin. This Plan is made with the express understanding and assumption that the Basin is of such condition that any water injected by Calleguas into the Basin will remain in the Basin until extracted by Calleguas (or by other pumpers). If this understanding/assumption is determined to be incorrect or determined to be substantially called into question, then **either** Calleguas or the Las Posas Basin Pumpers may immediately proceed to dispute resolution as set forth in Section 6 above.

END OF PLAN

A3.1 **EXHIBIT "A"**

FOX CANYON
GROUNDWATER MANAGEMENT AGENCY

July 12, 1994

Eric Berg, Projects Administrator
Calleguas Municipal Water District
2100 Olsen Road
Thousand Oaks, CA 91360-6800

SUBJECT: BOARD APPROVAL OF CMWD APPLICATION FOR INJECTION/STORAGE FACILITIES IN NORTH LAS POSAS GROUNDWATER BASIN

Dear Mr. Berg:

At the Board of Directors meeting on February 23, 1994, the Board approved the CMWD application for injection/storage facilities in the North Las Posas Basin. The approval of this application, as provided for under Ordinance 5.3, was subject to the conditions that follow. These conditions include several changes and additions requested by the Board of Directors.

NORTH LAS POSAS BASIN
INJECTION/STORAGE FACILITIES CONDITIONS

1. *The identification, size, depth, well logs and location of wells used for injection/extraction will be registered with the GMA. A maximum of twenty (20) wells all to be permitted by the County of Ventura, Public Works Agency, and registered with the GMA.*

2. *Calleguas will inject/extract on a schedule determined by availability of water to inject and the needs of their customers. The number of acre-feet injected/extracted from each well shall be reported to the GMA monthly. The monthly report shall also include a water quality analysis for the injected water that covers and conforms to the limits listed for the following items:*

a.	*Sodium Adsorption Ratio (SAR) calculated in meq/l as SAR=NA/((CA + Mg)/2)$^{.5}$*	*≥1≤4*	
b.	*Total Dissolved Solids (TDS)* *Electrical conductivity (EC)*	*≥100≤800* *≤1100*	*mg/l* *uMHO*
c.	*Chloride (Cl)*	*≤120*	*mg/l*
d.	*Boron (H_3Bo_3)*	*≤1*	*mg/l*
e.	*Nitrates*	*<45*	*mg/l*

(NOTE: These limits are based on University of California research. Should the University reverse these limits, the recommended changes will be incorporated into these conditions.)

800 South Victoria Avenue, Ventura, CA 93009
(805) 654-2088 FAX:(805) 654-3952

Eric Berg
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July 12, 1994

Testing shall be conducted monthly during periods of continuous injection, prior to beginning an injection of more than one hundred (100) acre-feet (but no more frequently than monthly), and as frequently as necessary when a change in water quality is suspected or known to exist.

3. *The total water in storage at any one time shall not exceed three hundred thousand (300,000) acre-feet (AF) unless approved by the GMA Board of Directors.*

4. *The point of extraction shall be the same as the point of injection or in the near vicinity. Extraction from points other than that of injection may be desirable and shall be coordinated with, and approved by the GMA.*

5. *Water stored by the facility shall be used in Ventura County.*

6. *Calleguas shall periodically review the effects of the injection on surrounding basins to ensure no detrimental effects result from the injection alone or in combination with natural recharge. Should negative effects exist, Calleguas shall take action to mitigate those effects caused by the injection program.*

7. *Should the injected water or conditions deviate from these standards, injection will stop, or not be started until the condition has been corrected.*

If you have any questions regarding this Agency's approval of your project facilities, please call Rick Farnsworth at 654-2327 or myself at 648-9204.

Very truly yours,

Lowell Preston

Lowell Preston, Ph.D.
Agency Coordinator

RF:vg

3GG/berg

A3.2 EXHIBIT "B"

Key wells will be used to monitor the overall health of the basin (Figure B-1). These wells, which have a long historic monitoring record of groundwater levels, include State Well Numbers 2N/20W-8F1, 2N/20W-9F1, 3N/20W-34G1, and 3N/19W-29K4.

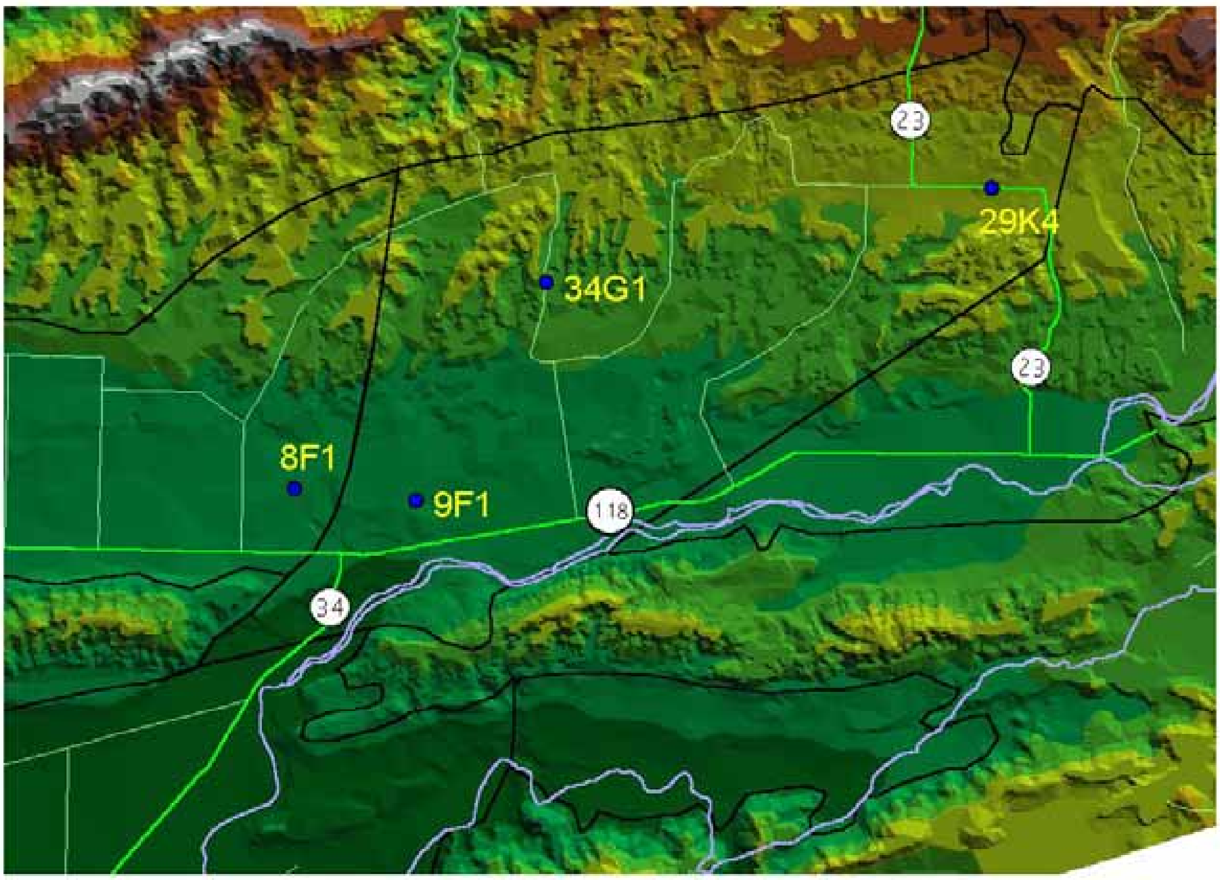

Figure B-1. Key wells in the Las Posas basin.

A3.3 EXHIBIT "C"

Calleguas Municipal Water District will monitor the effects of its Las Posas Basin ASR project using both its ASR wells and additional monitoring points surrounding the ASR project (Figure C-1). These additional monitoring points will consist of existing production wells or, where necessary to complete the area 1 coverage, new monitoring well(s) installed by Calleguas MWD.

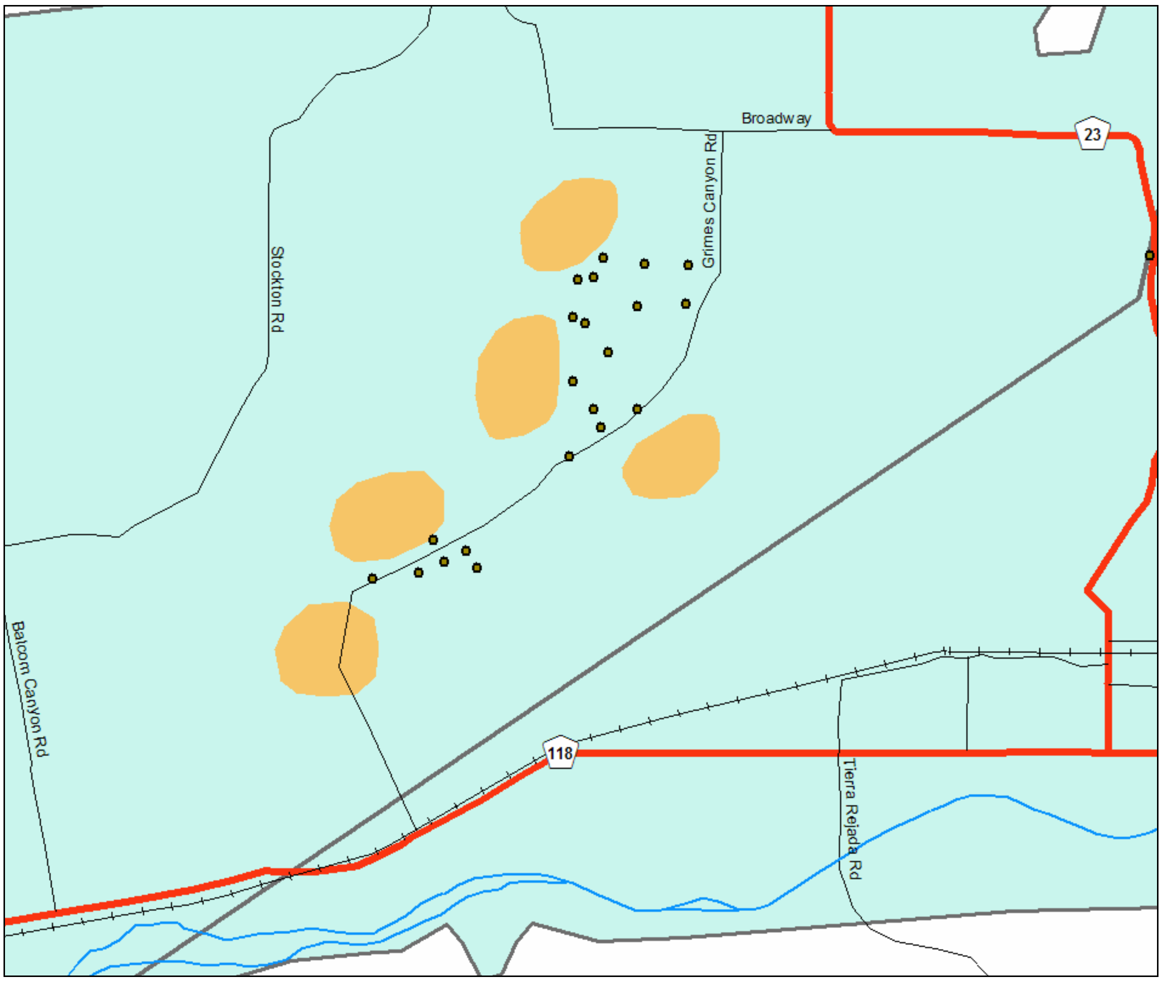

Figure C-1. Locations (indicated by orange circular areas) of monitoring to track the effects of ASR injection and pumping. Dots represent Calleguas MWD ASR wells.

A4.0 APPENDIX D. RESPONSE TO PUBLIC COMMENTS ON THE FCGMA GROUNDWATER MANAGEMENT PLAN

The development of the final FCGMA Groundwater Management Plan involved the release of three separate written drafts between June 2006 and February 2007, presenting the Plan at three public workshops over the same time period, and presenting the Final Plan at a special meeting for the Agency's Board of Directors in March 2007. The Agency accepted public comments throughout the Plan development process.

This section is a compilation of the written public comments to the Plan submitted to the Agency between June 2006 and April 2007. The first part contains a verbatim transcription of each comment and a specific Agency response to each comment. The second part contains a reproduction of the original public comment document.

FCGMA responses to written comments submitted on behalf of the City of Oxnard, City of Camarillo, and Crestview Mutual Water Company (Crestview) by:

Robert J. Saperstein
HATCH & PARENT
A Law Corporation
Santa Barbara, CA

1. ***Oxnard, Camarillo, and Crestview's Comment:*** *GMA Board attendance at the workshops. While we understand the time commitment is extensive, this update to the Management Plan is very important. It will guide GMA policy and decision-making for years to come. We are not sure how the GMA Board can obtain adequate familiarity with all the issues and the constituents' concerns without some attendance at the workshops. No board members attended the first workshop.*

Response to Oxnard, Camarillo, and Crestview's Comment #1: This issue was subsequently resolved by the Board member attendance at subsequent workshops and the Special Groundwater Management Plan Workshop held on March 9, 2007. Four Directors and two Alternate Directors were in attendance at this Workshop. Minutes for this meeting have been included in this Appendix (D) to the Groundwater Management Plan.

2. ***Oxnard, Camarillo, and Crestview's Comment: Executive Summary****. This Section is written as part introduction and part summary. An Executive Summary is normally drafted when the remainder of the document is complete. Given the length and technical nature of the material, the Executive Summary will be the most important Section of the Plan. It may be the only portion of the document many individuals read. It should summarize the purpose, issues and recommendations, once all of the technical work is complete.*

Response to Oxnard, Camarillo, and Crestview's Comment #2: Taking this suggestion, the Executive Summary was put on hold until the final draft. The final version now includes an Executive Summary

3. ***Oxnard, Camarillo, and Crestview's Comment: Acknowledgements*****.** *Throughout the document, there is repetitive recognition of United and Calleguas as the two entities who contribute to the GMA. This recognition is limited almost exclusively to these two entities. Either this self-congratulatory language should be eliminated, or there should be proper acknowledgement of the work of all the individuals and agencies who have and continue to contribute to the GMA's success.*

Response to Oxnard, Camarillo, and Crestview's Comment #3: The final Fox Canyon Groundwater Management Plan (Plan) acknowledges the contributions many contributors including members of the three sponsoring agencies (Fox Canyon Groundwater Management Agency, United Water Conservation District, Calleguas Municipal Water District) as well as six other stakeholders who provided written comments, reviews, or provided other material input to the completion of the plan. Any other omission of other individual who provided contributions to the completion of the FCGMP is the result of simple oversight.

4. ***Oxnard, Camarillo, and Crestview's Comment:*** *Modeling. There needs to be a distinct Section that better describes the model details used for the technical analysis. This Section need not be long, but it should include mention of the software, construction, assumptions and details of the model construct. It ought to give enough information for the technically capable reader to understand its basics.*

Response to Oxnard, Camarillo, and Crestview's Comment #4: There is now a considerable discussion of the modeling approach, assumptions, limitations, and modeling results included as Appendix B of the final FCGMP. While not an exhaustive technical discussion of model development and results, it provides a thorough and meaningful summary of the model approach and its use in the development and analysis of various policies developed in the Plan.

5. ***Oxnard, Camarillo, and Crestview's Comment: Organization and Redundancy.*** *There is tremendous redundancy in the report. Perhaps with different organization, it could be slimmed down significantly. You might describe the water quality and quantity issues generally applicable to all areas, along with the general concept of basin management objectives. Then discuss all the issues comprehensively, separated for each basin or in some cases regions with multiple basins. As an alternative, some of the nonessential background and detailed technical information might be moved to appendices.*

Response to Oxnard, Camarillo, and Crestview's Comment #5: The final Plan has been reorganized and indexed to limit redundancies and improve the organizational structure. Due to the interrelated nature and technical complexity of many of the water quality, water quantity, and public policy issues, some redundancy is necessary to provide the appropriate context for specific topics.

6. ***Oxnard, Camarillo, and Crestview's Comment: Management Strategies: Organization.*** *In a fashion, the Management Plan is really several separate management plans. Perhaps it should be organized by basin for the three content subjects: strategies under development, future strategies and actions to attain BMO's. There may need to be one more general Section that addresses those strategies that cross basin boundaries. You may be able to combine all the basin specific discussions in one Section for each basin. A couple different organizational approaches might be tested, with the goal of, reducing redundancy and volume of text.*

Response to Oxnard, Camarillo, and Crestview's Comment #6: See the response to Oxnard, Camarillo, and Crestview's Comment #5.

7. ***Oxnard, Camarillo, and Crestview's Comment: Specific strategy: Forebay priorities****. The potential over-reliance on the Forebay under certain conditions is acknowledged in the document. However, there is no mention of the importance, from a policy perspective, to establish some hierarchy for use of the Forebay. There will be increasing reliance on the Forebay. To the extent access to the Forebay may be limited under certain conditions; the GMA board must consider limiting certain uses before others.*

Response to Oxnard, Camarillo, and Crestview's Comment #7: As implied by Oxnard, Camarillo, and Crestview's Comment #7, the Plan acknowledges that the Oxnard Plain Forebay Basin represents one of the most significant sources of subsurface storage and recharge within the FCGMA. Specific groundwater management strategies directly involving the use of the Oxnard Plain Forebay Basin have been addressed in Sections 10.1.4, 10.1.5, 10.1.7. Other policy recommendations are addressed in Sections 11.2.2, 11.3.6, and 11.3.7. Through its discussion in these Sections as well as its implicit inclusion other strategies, the Plan acknowledges the significance and challenge of prioritizing use of the Oxnard Plain Forebay Basin. The Oxnard Plain Forebay Basin will remain a source of significant consideration and focus in the development of effective future strategies.

8. ***Oxnard, Camarillo, and Crestview's Comment: Specific strategy: Transfers across basins.*** *There is no direct mention that transfers (of allocation or credits) from challenged areas to areas of abundance may be the simplest method of mitigating problems. This has been a policy not favored in the past. However, this is an appropriate time to reconsider this*

question, particularly if the technical analysis suggests that a surgical approach is required to solve certain problem areas.

Response to Oxnard, Camarillo, and Crestview's Comment #8: Allocation or Credit transfers are now discussed in relation to several strategies that would physically move water from one basin to another, particularly moving credits to the Forebay Groundwater Basin. In addition, many of the listed potential water management strategies move river water or reclaimed water across basins to be used for either in-lieu deliveries that replace groundwater pumping, or for direct groundwater recharge. The fundamental concept of localized management strategies is also discussed in Section 10.1.7.

9. Oxnard, Camarillo, and Crestview's Comment: Specific strategy: Ag recycled water use*. The draft Plan acknowledges (assumes) that larger volumes of recycled water will be available for Ag use in the future. The assumption is correct that highly purified recycled water will be available and recycled water use could be a very efficient method of solving several regional problems. However, there is some resistance in the Ag community to take direct use of recycled water. The resistance is not over the quality of the recycled water, but over the required reporting to distributors and product buyers that the crop was grown with recycled water. As long as there is the Ag industry perception that recycled water use may harm the user's competitiveness, recycled water will not be widely accepted. The Board may be able to help influence certain industry groups to alter the current reporting requirements that create these problems for individual users.*

Response to Oxnard, Camarillo, and Crestview's Comment #9: The comment is noted.

10. Oxnard, Camarillo, and Crestview's Comment: Analytic Methodology. *There appears to be no intent to model the expected (inevitable) conversion of Ag use to M&I use over the period of the modeling run. Without this detail, the modeling exercise may provide very misleading results. For example, there are several significant Ag to M&I projects that are in the planning stages located in the south Oxnard Plain area, nearby the City's wastewater treatment plant and the military bases. The result of these conversions will be a shift in groundwater use from wells in a highly sensitive area, to City and United wells located far from the coast (and imported water). If the model does not take into account these expected transitions, it will predict a materially different future than that which will occur. In this fashion, the modeling results may be very misleading.*

Response to Oxnard, Camarillo, and Crestview's Comment #10: The groundwater modeling purposely kept land use constant through the forward model period to analyze the quantitative effect of different groundwater management strategies (such as 5% reduction of historical allocation or implementation of an injection barrier). A typical model-based quantitative analysis, including the Ventura Regional Groundwater Model (VRGM), alters only one variable at a time to determine its effect on the entire system. Often, if more than one variable is changed, (e.g., adding a management strategy plus changing land use), the quantitative effect of either variables is obscured. The effect of changing land-use was not one of the variables examined in this analysis; however, adding such a scenario would be instructive. As part of the Plan implementation process, this may be one of the recommendations to the Technical Analysis Group (TAG).

11. Oxnard, Camarillo, and Crestview's Comment: Water Quality. *It is somewhat troubling that the cornerstone of the Plan is the setting of Basin Management Objectives, some of which are water quality objectives. However, the model has no capability to predict water quality changes. Thus, we need to be very careful in how we set and monitor compliance with the Basin Management Objectives.*

Response to Oxnard, Camarillo, and Crestview's Comment #11: It is true that the groundwater model cannot directly predict water quality changes, although there is some capacity to determine the effects of seawater intrusion in coastal areas. In these areas, controlling seawater through management of groundwater elevations is a priority goal and key component of the management plan, and is addressed in Sections 9.1, 10.2.1, and 10.3.1. In other areas, the BMOs are the Regional Board's Basin Plan Groundwater Objectives Other water quality objectives and are discussed in Section 6.1, 9.2, 9.3, 10.1.3, and 10.1.4. In the Forebay basin, nitrate BMO's are set at the Department of Health Services notification level for drinking water. As part of the Plan implementation process, this may be one of the recommendations to the Technical Analysis Group (TAG).

12. Oxnard, Camarillo, and Crestview's Comment: Periodic update. *Either as a component of the Plan, or as a Board measure in adopting the Plan, there should be a built in requirement to update the Plan no less than every 5 years. This should not be so difficult if the model proves to be as useful a tool as is expected.*

Response to Oxnard, Camarillo, and Crestview's Comment #12: This recommendation for periodic reviews and updates are now a strategy and action item in the Plan and is discussed in Section 11.1.3.

13a. Oxnard, Camarillo, and Crestview's Comment: Pg. 12. There is no such thing as "in-lieu"' credits. Ordinance 8 only defines storage and conservation credits. There are special credit transfer agreements/programs the GMA has approved that amount to "in-lieu" transfer of credits, but the term has no meaning in Ordinance 8.

Response to Oxnard, Camarillo, and Crestview's Comment #13a: The reference to "In-Lieu" credits have been eliminated or corrected and the term in-lieu is only used to refer to imported, surface, or reclaimed water that could be used instead of extracted groundwater.

13b. Oxnard, Camarillo, and Crestview's Comment: *Ordinance 8 requires Ag to demonstrate 80% efficiency, based on the individual crops grown. The Plan does not propose tightening the efficiency percentage as a potential method of reducing water use. Also, the current reporting requirements are not clear in requiring that the efficiency calculation is to be based on irrigated acreage, not total owned property. In some cases, the irrigated acreage may be materially smaller than the property footprint. In that circumstance, the user gets a substantial benefit in reporting efficiency based on the property footprint instead of the irrigated acreage.*

Response to Oxnard, Camarillo, and Crestview's Comment #13b: As indicated in Section 11.2.4, an examination of the irrigation efficiency allocation will be undertaken as part of the implementation of the Plan.

13c. Oxnard, Camarillo, and Crestview's Comment: Pgs. 13, 16. *There is no mention of M&I return flows as a source of recharge.*

Response to Oxnard, Camarillo, and Crestview's Comment #13c: Return flows have been added as a nominal potential recharge source, with the caveat this only occurs in some areas. In fact, return flows can only reach the main FCGMA aquifers in a few areas where there is hydrologic continuity between surface uses and these aquifers – elsewhere, it is intercepted by impermeable layers and/or perched aquifers.

13d. Oxnard, Camarillo, and Crestview's Comment: *Two different definitions of basin yield are used and overdraft is not defined.*

Response to Oxnard, Camarillo, and Crestview's Comment #13d: Section 7.0 of the final Plan addresses the concept of Yield of Groundwater Basins, its calculation, and the associated assumptions.

13e. Oxnard, Camarillo, and Crestview's Comment*: The discussion of the decreasing trend of extractions is incomplete and therefore misleading. As to the Ag side: (1) there is no quantification of the reduction of Ag pumping resulting from reduced acreage in production over the past two decades, and (2) there is no recognition that the initial period against which we are measuring reduced usage was a very dry period. During dry periods, Ag groundwater use tends to be greatest. Since those early years, we have been in a generally wet period. Thus, we would expect a natural reduction in Ag groundwater use simply based on the historical hydrology*.

As to the M&I side, there is no quantification of the increase in municipal demand as a result of conversion of Ag use to M&I use. There is no discussion of the relative efficiencies of use of water prior to the imposition of the cutback goals. The implication of the current discussion in the Plan is that Ag has done more than its share and M&I has not. There is insufficient information or analysis for this conclusion or implication. This discussion should either be made complete and correct, or eliminated, especially if policy decisions might be influenced by it.

Response to Oxnard, Camarillo, and Crestview's Comment #13e: The language has been changed to eliminate any implication that M&I has not done its share of water conservation or planned reductions in overall groundwater extractions. An example of ag to urban conversion was also added. The discussion of reduction in pumping does not simply compare the dry years of the base period to the wet years following that period to document reductions in pumping. Instead, extraction in like years were compared (dry to dry, wet to wet), with the comparison included in the discussion of overall FCGMA annual extractions and any changes over time. Therefore, the language on FCGMA pumping reductions remains in the Plan.

13f. Oxnard, Camarillo, and Crestview's Comment: Pg.29. *The discussion of increasing salt concentrations in the Las Posas basins is somewhat conclusory and incomplete. It might help to actually provide the POTW discharge water quality for TDS and chlorides, so that it would be more clear to the reader that the problem is, in fact, generating from aquifer conditions, not discharge water quality.*

Response to Oxnard, Camarillo, and Crestview's Comment #13f: Language was added to point out that chloride concentrations of surface waters (including POTW discharges) were considerably lower than those of the affected aquifer. While it is true that the problem was not generated by the quality of the discharge water, the problem appears to have been created by the increased quantity of discharge water (POTW's plus Simi Valley Groundwater Basin dewatering and increased urban runoff throughout the watershed). The higher stream flows created by these discharges have apparently filled the shallow aquifer above historic levels, which may be dissolving salts in the previously unsaturated portion of the shallow aquifer. The Plan references a report done for Calleguas MWD for a more-detailed discussion of this water quality problem.

FCGMA responses to written comments submitted on behalf of the City of Oxnard by:
Anthony Emmert
Water Resources Manager
City of Oxnard, California

1. Oxnard's Comment: *At the last workshop on the draft Plan, the group discussed the potential that incorrect assumptions about the quantity of groundwater production could result in erroneous outcomes from the model. Indeed, there is substantial anecdotal evidence that groundwater production reporting may be materially incorrect because of inaccurate meters or other faulty reporting mechanisms. For this reason, we recommend that the model be run to assume a band of uncertainty relating to the quantity of groundwater production within FCGMA. Such sensitivity analysis will help verify the integrity of the model results.*

Response to Oxnard's Comment #1: A sensitivity analysis was added to the discussion of model results in Appendix B of the final Plan. Following implementation of the meter calibration program scheduled to begin in mid-2007, it would be prudent to revisit this issue to ensure the model is calibrated with the most accurate extraction data.

2. Oxnard's Comment*:* *As a related matter, the FCGMA will pursue an aggressive review of meter calibrations over the next several years. However, this process is not scheduled to start until 2007 and it will take three years to complete the first cycle. We recommend that the model be periodically rerun and updated with this new, more accurate production data when it becomes available. In the interim, we recommend that FCGMA staff review suspect accounts and perform a preliminary audit of groundwater production reporting to determine the scope of potential discrepancie*s.

Response to Oxnard's Comment #2: Periodic reviews and updates to both the VRGM and the Plan are now a strategy and action item in the Plan (Section 11.3.1). More frequent changes or additions to the Management Plan and/or changes to the model could be performed at the Board's discretion, although additional funding may need to be obtained for such efforts.

The final Plan contains a discussion of verification of extraction reporting as a management strategy as well as a proposed procedure for verification. Verification of extraction reporting coupled with revised model inputs represents a fundamental step to enhancing the accuracy and effectiveness of the model. Both are addressed in the final Plan.

FCGMA staff has, and continues to, work diligently on an ongoing basis to identify, research, and, to the extent practical, correct extraction reporting anomalies. Fundamentally, the current system relies on the honesty, forthrightness, and diligence of individual well operators. Given that the Agency has limited resources, the FCGMA will need to continue to rely on self-monitoring reports from the operators, education efforts highlighting the need for accurate reporting, and the contributions of its member agencies to enable it to capture the most accurate data available.

3. Oxnard's Comment: *The Draft Plan sets forth several potential future management strategies that should be further explored for their potential effectiveness in addressing seawater intrusion and other adverse hydrogeologic conditions. We recommend that the next draft of the Plan prioritize these potential future strategies in terms of their potential effectiveness. We further recommend that the FCGMA develop procedure to apply a cost/benefit analysis to determine which of the prioritized strategies should be implemented.*

Response to Oxnard's Comment #3: The final Plan (October 2006) prioritizes groundwater management strategies as suggested. At the March 2007 special Groundwater

Management Plan Workshop, the FCGMA staff introduced a proposed implementation approach that involves both technical and strategic advisory groups that would work together to evaluate each of the groundwater management strategies on both a technical and a cost/benefit basis. These groups will subsequently provide recommendations to the Board.

4. ***Oxnard's Comment:*** *As a general matter, we also encourage the FCGMA to consider more dynamic use of aquifers with dewatered storage space as a potential resource for future conjunctive use programs. Other basins, such as the Chino and Orange County basins, are currently planning and using available dewatered storage space for local and regional conjunctive use programs that yield better water supply reliability and financial benefits to support other necessary basin management programs. The FCGMA could pursue similar programs. There are numerous hydrogeologic and policy matters that must be resolved to implement a large scale groundwater storage program. Still, we recommend that the Plan include additional and more detailed discussion of potential opportunities for active conjunctive use programs within the FCGMA area.*

Response to Oxnard's Comment #4: The final Plan includes several strategies that utilize existing aquifer space for storage including the Oxnard Plain Forebay Basin (Sections 9.6.6, 10.1.5, 10.2.2), the South and East Las Posas Basins (Sections 9.2, 10.1.7, and 10.1.10) and the Pleasant Valley Basin (Sections 9.3, 10.1.7, and 10.1.10) In addition, the use of recycled water for injection is discussed in Section 9.1. Ultimately, the technical and cost/benefit of each of these strategies will have to be evaluated by the advisory group(s) and recommended to the Board for implementation.

FCGMA responses to written comments submitted on behalf of Pleasant Valley County Water District (PVCWD) by:

Mr. John Mathews
Arnold, Bluel, Mathews, & Zirbel, Attorney's at Law, LLP
Oxnard, CA
Legal Counsel for Pleasant Valley County Water District
Camarillo, CA

1. ***PVCWD's Comment:*** *Under the section "Groundwater Extractions", in the third paragraph it refers to increased agricultural efficiencies. We believe that somewhere in this paragraph reference should be made to the fact that extractions from the groundwater may have also decreased because increased yields from the Freeman diversion and the Conejo Creek project.*

Response to PVCWD's Comment #1: A sentence has been added as suggested.

2. ***PVCWD's Comment****: On page 43, in the section entitled "Assessment of Basin Management Objectives", in the second paragraph it refers to Basin Management Objectives (BMO's) for groundwater levels in the Pleasant Valley basin. In table 3, it makes reference to Basin Management Objectives in the Pleasant Valley area, but does not set forth what the current levels are, it would be helpful to state the groundwater BMO's.*

Response to PVCWD's Comment #2: Current levels have been added to all the BMO tables.

3. ***PVCWD's Comment:*** *On page 48, under the Section "Contingency Plan for LAS Seawater Intrusion", it states that the GMA staff has developed a contingency plan to address the intrusion of seawater into the LAS. It would be helpful if drafts of that Contingency Plan could be made available for public review.*

Response to PVCWD's Comment #3: As stated in the final Plan (Section 8.1), no formalized Contingency Plan for LAS Seawater Intrusion exists. The original FCGMA Groundwater Management Plan completed in September 1985 contained a list of countermeasures that could be employed either temporarily or for longer periods of time to offset an extreme and threatening loss of fresh water resources. Some of the schemes listed, such as a complete ban on all future LAS wells, forced urban and farm water conservation, or monetary incentives to encourage destruction of LAS wells, have limited feasibility at the present time. Others such as implementing voluntary conservation measures, changing the County Well Ordinance to limit new LAS wells, and additional monitoring efforts either proposed in the current plan or already under development.

4. ***PVCWD's Comment****: On page 50, under the Section "Conejo Creek Diversion Project", the last sentence references that over the "net 20 years" that the yield of the diversion might decrease. There obviously is a spelling error there in that the word "net" should be "next". Furthermore, input should be sought from Camrosa Water District to determine whether or not their proposed plans will in fact reduce yield to Pleasant Valley. In discussions with Richard Hajas, it is our understanding that Camrosa's intent is to continue to provide current levels of diverted water to Pleasant Valley and in fact yields may be increased.*

Response to PVCWD's Comment #4: The typo has been corrected. The information in this Section was based on a conversation with Camrosa staff, who emphasized that yields of the Conejo Creek diversion project may not always be available to PVCWD.

5. ***PVCWD's Comment:*** *Under the Section "Great Project (Recycled Water)", the first paragraph makes reference to the delivery of recycled water to the Pleasant Valley area. PVCWD has continued to express their concerns to the City of Oxnard about the suitability of the recycled water for agricultural use. In particular, Pleasant Valley is concerned about the "stigma" that recycled water has in the market place. Many growers are now required to provide information on the source of their irrigation water. In the event that recycled water is used, the agricultural produce is often downgraded.*

   Also, Pleasant Valley has concern about the injection of recycled water into the LAS. Injection into the LAS is discussed on pages 65 and 66 (June 2006 Draft Plan). Because the LAS is the only groundwater source for the PVCWD, Pleasant Valley will closely scrutinize any injection of recycled water into the LAS. We feel that a better alternative to injection would be the transportation of the recycled water to the spreading grounds. This would enhance recharge and remove concerns relative to injection.

Response to PVCWD's Comment #5: The use of reclaimed water, as well as most or all of the proposed strategies will need to be analyzed for both technical feasibility and cost/benefit considerations prior to implementation. At that time, the proposed alternative, as well as other alternatives, will be considered. Indeed, the purpose of the advisory groups proposed by the FCGMA Staff at the March 2007 Special Groundwater Management Plan Workshop is to evaluate both the Plan-proposed and alternative groundwater management strategies.

With respect to the specifics of your proposal, the alternative to injection suggested above has two major drawbacks:

1) Reclaimed water recharged in the spreading grounds is not as quantitatively effective or efficient in recharging the Lower Aquifer on a unit for unit basis as using the water in place of extracted groundwater or injecting water directly into the areas with lowered groundwater levels; specifically, the south Oxnard Plain and Pleasant Valley basins; and

2) Reclaimed water delivered via pipeline to the spreading grounds would trigger a host of California Department of Health Services (DHS) requirements, including a zone surrounding the spreading grounds where no groundwater could be pumped for potable use. The DHS requirements for the spreading grounds with piped reclaimed water could significantly alter United Water's operations of the spreading grounds. Any directly injected recycled water would be subject to existing or future DHS stringent water quality standards for domestic consumption, which are very stringent.

6. ***PVCWD's Comment****:* *Under the Section "Non-Export of FCGMA Water", the last paragraph on that page states "It appears that current ordinances and policies of the FCGMA are sufficient to deal with its export issue." In light of recent issues, the ordinances of the GMA should be reviewed again to make sure that they are adequate to address the export issues. In particular, the enforcement provisions relating to export of "GMA" water should be closely reviewed.*

Response to PVCWD's Comment #6: A discussion about reviewing the sufficiency of current ordinances and policies was added to the Plan in Section 10.1.8.

7. ***PVCWD's Comment****:* *Under the Section "Increase Diversions from Santa Clara River, Potential Effectiveness". the first sentence states "The Santa Clara River remains a primary recharge source for the Oxnard Plain and Pleasant Valley basins." Based upon our understandings of various studies, it is a little misleading to suggest that the Pleasant Valley*

basin gets much recharge from the Santa Clara River. Although there may be some recharge, even that is disputed, it is clear that the amount of recharge is minimal at best.

Response to PVCWD's Comment #7: PVCWD's comment has merit and the corresponding text has been amended to indicate there is some uncertainty with regards to the quantitative contribution of the Santa Clara River to the southern portion of the Oxnard Plain Pressure Basin and the Pleasant Valley Basin. However, the Santa Clara River likely provides significant recharge to the northern Oxnard Plain Pressure Basin. It is probably not accurate to portray the recharge going to Pleasant Valley from the Santa Clara River as "minimal at best." Although recharge to this basin is hampered by the zone of lower conductivity (fault?) that separates it from the Santa Clara River, there is still recharge moving across the zone. The river also alleviates the need for some recharge through the pipeline delivery of surface water as a replacement for extracted groundwater.

8. PVCWD's Comment*: Under the section "Shelf Life for Conservation Credits", it is Pleasant Valley's opinion that at the present time there is no need for "sunsetting" of conservation credits. While conservation credits have been built up by not only Pleasant Valley, but other entities, it was the very purpose of allowing for conservation credits so that the credits could be retained and used for future needs. Pleasant Valley sees no present need to "sunset" the conservation credits. Credits would only be used when there was inadequate surface water from the Freeman Diversion and the Conejo Creek Project, and pumping from our wells were insufficient to meet our needs. Putting a shelf life on credits seems to suggest that Pleasant Valley would utilize their credits to over-pump and waste water.*

It is also our opinion that putting a shelf life on credits, will also remove incentives to look for creative water solutions. For example, much of the impetus for Pleasant Valley to participate in the Conejo Creek Project, was the fact that credits would be generated.

Response to PVCWD's Comment #8: Your comments are noted. Currently, there are no restrictions on the use of conservation credits, thus there is significant potential for over-use of the groundwater resource through the conservation credit program. The "sunsetting proposal" has been one of several proposals advanced by FCGMA stakeholders to mitigate the potentially negative consequences of the current credit program. Ultimately, current program will need to be evaluated in the context of the groundwater conditions and other groundwater management strategies to determine its potential benefit/consequences.

FCGMA responses to written comments submitted on behalf of Saticoy Country Club (SCC) by:

Mr. John Powell, Water Committee Representative
Saticoy Country Club

1. ***SCC's Comment:*** *Continuation of 25% Pumping Reduction. SCC supports all efforts to bring the basins into safe yield and we not only have committed to reduce our overall pumping but we also have committed significant capital resources to increase our efficiencies. As briefly described above we have made a significant efficiency effort already through our infrastructure alterations and water management practices and will continue that effort in the future. As such it is our opinion that to continue the phased reductions to the full 25% reduction (with possible further reductions) only to M&I users is unfair and that the Draft Management Plan Update should either include provisions to reward increases in efficiencies by M&I users and/or to implement additional productive measures to also reduce agricultural pumping. Agricultural users consume far more of the resource and it is completely unfair to place the burden of balancing the basin on the M&I users.*

Response to SCC's Comment #1: Your comments and continuing conservation efforts are very much appreciated. As a point of clarification, the proposed further reductions in groundwater extraction under historical allocation are **not** limited to M & I Operators as suggested by your comment. Other extraction reduction strategies included in the final Plan include a change to the Irrigation Efficiency Calculation (Section 10.1.9) and Additional Water Conservation strategies (Section 10.1.12). A generic discussion of M&I and agricultural conservation efforts has been added the final Plan (Section 4.0).

One of the somewhat surprising conclusions that resulted from the many computer modeling scenarios was that implementation of the remaining two 5% scheduled reductions in Historical Allocations would not eliminate the overuse of groundwater resources within the FCGMA. Thus, reduction of allocation will have to be considered in conjunction with other groundwater management strategies. Ultimately, the responsibility for efficient and effective groundwater use falls on all of the FCGMA stakeholders.

2. ***SCC's Comment: Shelf Life for Conservation Credits.*** *We understand the potential concerns of accumulating Conservation Credits with no expiration date and that this accumulation effectively has left a large theoretical pumping debt on the aquifers. Sunset provisions may be warranted in many cases. Our initial concerns with this proposed provision alteration is how it may impact different size users and also the potential for removal of credits earned through our continued efficiency improvements.*

Response to SCC's Comment #2: As noted in a response to similar comments, there are no restrictions on the use of conservation credits, thus there is significant potential for over-use of the groundwater resource through the conservation credit program. The "sunsetting proposal" has been one of several proposals advanced by FCGMA stakeholders to mitigate the potentially negative consequences of the current credit program. As part of the implementation of the Plan, both the quantitative contribution and cost/benefit of all groundwater management strategies will be evaluated as part of the development process.

FCGMA responses to written comments submitted on behalf of the City of Camarillo (Camarillo) by:

Ms. Lucia McGovern, Deputy Public Works Director
City of Camarillo

1. ***Camarillo's Comment:*** *Page 58* (of the June 2006 Draft Plan Draft Plan) *indicates the following, "the City of Camarillo is considering a strategy to move some of its current pumping from the area of the LAS pumping depression beneath Pleasant Valley to this area of poorer-quality rising groundwater. Under this plan, the poorer-quality water would be extracted and desalted in a similar manner to the South Las Posas Basin project approved by the FCGMA."*

   Recommended Action: Consider replacing this text with the following, "The City of Camarillo has assessed the feasibility of constructing a Groundwater Treatment Facility that would be located in the Somis Gap area of the Pleasant Valley Basin (Black & Veatch, August 2005). The study determined the project to be technically feasible and would allow Camarillo to halt pumping from an area of the LAS with depressed groundwater levels and instead pump in an area of rising groundwater levels. This plan is similar in nature to the South Las Posas Basin project, which was previously approved by the FCGMA Board and consistent with policy to move pumping to areas of known substantial recharge (i.e., Oxnard Forebay) which will create more storage space for future recharge events. The City of Camarillo proposes to coordinate pumping strategies between various stakeholders in the neighboring sub-basins in order maintain replenishment of the Pleasant Valley Basin."

<u>Response to Camarillo's Comment #1</u>: Some of this language has been added to the final Plan. Parenthetically, moving pumping away from Camarillo's airport wells has been simulated using the Ventura Regional Groundwater Model, with results discussed in Appendix B of the revised report and included in the discussion of this particular management strategy.

As a point of clarification, the Board **has not**, in fact, approved any plan for pumping without allocation in the South Las Posas Basin, although the Board has addressed the potential for consideration of such a plan. Specifically, Resolution 2003-03 states that "an allocation for pumping from the South Las Posas Basin may be changed or altered to accommodate a responsible entity that submits **a plan** to render this groundwater usable"[*] To date, no specific plan has been approved through ordinance or resolution by the Board.

2. ***Camarillo's Comment****: The majority of the discussion on page 58 focuses on the development of brackish groundwater in the LAS of the Pleasant Valley Basin by means of Camarillo's Groundwater Treatment Facility project. However, the third paragraph awkwardly mixes in a brief discussion of an alternate subject in an area of the Pleasant Valley Basin that is far away from the observed recharge in the Forebay.*

   Recommended Action: Please elaborate on the significance of this paragraph to Camarillo's Groundwater Treatment Facility Project or relocate this paragraph to an alternate location to maintain the continuity of the discussion regarding Camarillo's Groundwater Treatment Facility project which is in the Forebay.

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[*] FCGMA, 2003. Item 4: Minutes of the October 22, 2003 Board Meeting *<u>in: Full Agenda for the December 17, 2003 FCGMA Board Meeting.</u>*

<u>Response to Camarillo's Comment #2</u>: The paragraph has been revised to reflect this comment, however we cannot agree with Camarillo's use of the term "Forebay" when discussing a possible unconfined area near the town of Somis at the northeastern corner of the Pleasant Valley Basin. There is at present, no comprehensive and conclusive evidence to support the concept that this area acts like a "Forebay" from a hydrogeologic standpoint. Further, the use of this term could be misleading when used in context with the rest of the FCGMA Management Plan where "Forebay" refers to the Oxnard Plain Forebay Groundwater Basin adjacent to the northern end of the Oxnard Plain Pressure Groundwater Basin.

3. ***Camarillo's Comment:*** *Page 17 (June 2006 Draft Plan) provides the following description of the Pleasant Valley Basin, "Despite the fault barrier to the west, the LAS is in hydrologic continuity with the adjacent southern portion of the Oxnard Plain Basin, which is the primary recharge source for the Pleasant Valley Basin."*

Two paragraphs later, the following is stated, "At the northeast edge of the Pleasant Valley basin, where Arroyo Las Posas flows cross the basin boundary, increased flows in the arroyo have apparently percolated directly into the LAS, significantly raising groundwater levels in City of Camarillo wells. This recharge suggests that this portion of the Pleasant Valley Basin is unconfined, contrary to current understanding of the basin. "

Recommended Action: Consider the following definition of the Pleasant Valley Basin and explanation of recharge sources for this basin:

Historically it was assumed that the LAS of the Pleasant Valley Basin was relatively confined and received little overall recharge. This assumption was based on the understanding that the primary recharge source for this basin was from the adjacent Oxnard Plain Basin to the south and recharge potential between these basins was low due to the low permeability of the Pleasant Valley Basin aquifer in this region, as well as the presence of a fault barrier in the lower portions of the Oxnard Plain. However, since the early 1990s, water levels have begun to rise in the northern adjacent basins. The City of Camarillo has two existing wells in .the northeast portion of the Pleasant Valley Basin (hereafter called the Somis Area) and these wells confirm that rising water levels in northern adjacent basins directly impact recharge rates, water quality, and water levels in the Somis Area.

The recharge in the Somis Area (Pleasant Valley Forebay) may be a result of the Saugus Formation being folded upward and subsequently eroding away in the Somis gap area covering the underlying bedrock with a predominantly sandy alluvial layer that allows rapid stream flow percolation. If this theory is correct, it is also likely true that the primary source of recharge for the Pleasant Valley Basin prior to the decline of the water levels in the adjacent northern basins was a forebay in the Pleasant Valley Basin and this primary recharge source is again prevalent due to the recent rise in water levels in the northern basins. It is recommended that additional monitoring and studies be conducted to determine if this theory is correct."

Figure 1 illustrates the conceptual location of the Pleasant Valley Forebay.

<u>Response to Camarillo's Comment #3</u>: Much of this suggested language has been included in the final Plan (Section 3.0). Section 3.0 significantly revises the text to indicate the degree of uncertainty in this area with respect recharge and hydrogeology. There is agreement that the northern portion of the Pleasant Valley basin south of Somis needs to be better understood and there is significant recharge occurring in this area of the basin. The details of how this recharge impacts the main portion of the Pleasant Valley basin needs further evaluation, with the result of the study integrated into the conceptual geology of the Ventura Regional Groundwater Model.

The term "Pleasant Valley Forebay" is not used for the reasons cited in the response to the previous Camarillo's Comment #2.

4. ***Camarillo's Comment***: *Page 58 (June 2006 Draft Plan) indicates the following, "Base flow from the Arroyo Las Posas has migrated completely across the South and East Las Posas Basins and into the northernmost Pleasant Valley Basin, providing a source of new recharge to this portion of the Pleasant Valley Basin. Coordination in pumping strategies between the sub-basins is recommended in order to avoid negatively impacting groundwater levels in the Fox Canyon Groundwater Basin." As stated in Camarillo's Comment #3, this may not be a "new" source of recharge but instead reestablishing of an old source of recharge to the Pleasant Valley Basin.*
   Recommended Action: Consider revising the text to indicate that the Somis Gap was potentially the primary recharge source for the Pleasant Valley Basin prior to pumping activities in the northern adjacent basins.

Response to Camarillo's Comment #4: See our response to Camarillo's Comment #3 above. Section 3.0 significantly revises the text to indicate the degree of uncertainty in this area with respect recharge and hydrogeology.

5. ***Camarillo's Comment:*** *The Draft GMP does not segregate the Pleasant Valley Basin into sub-basins, it only describes the basin as a whole. Furthermore, the last sentence of the second paragraph of page 17 (June 2006 Draft Plan) indicates a lack of current understanding of this basin.*
   Recommended Action: Please elaborate on the current understanding of the Pleasant Valley Basin and clarify how the basin is currently handled in the model. It is also recommended that the authors consider sub-dividing the Pleasant Valley Basin into sub-basins (Pleasant Valley Forebay and Pleasant Valley Basin) to assist in evaluating the different potential recharge sources for the basin.

Response to Camarillo's Comment #5: See responses to the previous two Camarillo's Comments.

6. ***Camarillo's Comment***: *The second paragraph on page 33 (June 2006 Draft Plan) indicates groundwater levels in the LAS have consistently been below sea level in the Pleasant Valley Basin. This is not true across the entire basin.*
   Recommended Action: Clarify that water levels in the southern portion of Pleasant Valley Basin have historically been below sea level since the 1950's. However, water levels in the northeastern portion of the basin near the Somis gap have historically been above sea level and continue to rise along with levels in the adjacent northern basins.

Response to Camarillo's Comment #6: The text has been amended appropriately in the final Plan.

7. ***Camarillo's Comment***: *The last sentence of the second paragraph on page 29 (June 2006 Draft Plan) states that: "It is too early to know whether chlorides in the Pleasant Valley Basin will escalate to a problem affecting local pumpers." This sentence is restated in the third sentence of the second paragraph on page 35. In both places it should be noted that two City of Camarillo wells (Wells A and B) have already been impacted by a rise in chlorides, which has prompted the City to discontinue use of Well A and to blend water from Well B with higher quality imported water to meet drinking water standards.*
   Recommended Action: Revise the referenced sentences to indicate that chloride levels in the southern portion of the basin have risen marginally from rising water levels, but due to limited data, the marginal rise of chloride levels could be much higher. However, as shown on Figure 14 of the draft GMP, sulfate and TDS levels in the northern portion of the Pleasant Valley Basin have been rising steadily and have already exceeded secondary drinking water standards. Available data also indicate that concentrations of iron and manganese are also

rising in response to basin recharge and have risen to levels that impair M&I uses.

Response to Camarillo's Comment #7: The text has been amended appropriately in the final Plan.

8. ***Camarillo's Comment**: Page 35 (June 2006 Draft Plan) provides discussion on increasing sulfate and chloride levels in the northern Pleasant Valley Basin and indicates water treatment will be needed for potable or irrigation use.*
   Recommended Action: Consider expanding the discussion to include the following text:
   "Camarillo has evaluated the feasibility of constructing a Groundwater Treatment Facility that would intercept a portion of the poorer water quality surge and remove salts from the aquifer system. This would help protect the water quality in the southern portion of the basin and preserve higher quality water for use by other pumpers in areas of major overdraft. Furthermore, by utilizing the water from the Groundwater Treatment Facility, Camarillo could curtail or eliminate pumping operations in the southern portion of the Pleasant Valley Basin, which would promote recovery of the depressed water table in that region. Further details of the project are provided in the Section titled, Development of Brackish Groundwater, Pleasant Valley Basin."

Response to Camarillo's Comment #8: Appropriate language has been added to Section 5.2.3 and Section 9.3 of the final Plan. Based on the data and analyses available at this time, it is not known whether a groundwater treatment facility in the northern half of the Pleasant Valley basin would necessarily help to protect water quality in the southern portion of the basin. There is also significant potential for increased pumping associated with a treatment facility to worsen water quality in the southern portion of the Pleasant Valley Basin. Given that there is limited study and data on the area and no quantitative analysis regarding such a system, any statements regarding its success or failure are speculative.

9. ***Camarillo's Comment**: The second sentence of the last paragraph on page 43 (June 2006 Draft Plan) indicates, "Basin Management Objectives (BMO's) for chloride concentrations in the Pleasant Valley Basin are currently being met, although chlorides are rising slowly in a few wells in the basin."*
   There are a number of wells that indicate that the BMO's are not being met. For example, County data indicate that well 01N/21W-01B04 screened from 820 to 1,150 feet has chloride greater than 200 mg/l, well 01N/21W-03C01 is screened from 956 to 1,216 feet has chloride greater than 260 mg/l, and well 01N/21W-01D02 is screened from 107 to 437 feet with chloride greater than 450 mg/l.
   Recommended Action: Consider revising the statement to indicate that BMO's are not currently being met throughout the entire Pleasant Valley Basin.

Response to Camarillo's Comment #9: The text has been amended appropriately in Section 6.2 of the final Plan.

10. ***Camarillo's Comment**: The first sentence of the last paragraph on page 58·(June 2006 Draft Plan) indicates, "Under current FCGMA policy, City of Camarillo pumping of poor-quality groundwater along Calleguas Creek would have to be pumped using existing allocations if the well was within the FCGMA boundary." The City of Camarillo understands that current FCGMA policy has evolved over time and has previously allowed unrestricted pumping of poorer quality shallow groundwater, with the semi-perched zone in the Oxnard Plain and the South Las Posas along the Arroyo being two examples.*
    Recommended Action: .Consider revising the last paragraph of page 58·(June 2006 Draft Plan) to say: "Previously, City of Camarillo pumping of poor-quality groundwater along Calleguas Creek would have to be pumped using existing allocations since the wells are within the FCGMA boundary. However, as FCGMA policy has evolved over time,

unrestricted pumping of poorer quality shallow groundwater has been allowed. For the Camarillo Project, a coordinated effort between the FCGMA and City of Camarillo should be undertaken to define the potential benefits of operating the City of Camarillo Groundwater Treatment Facility. Extractions of poor-quality water without allocations are discussed in more detail in the Section titled "Recommended Additions to FCGMA Policies."

Response to Camarillo's Comment #10: This comment is addressed in Section 9.3 of the final Plan. A formal written policy that includes criteria for these types of projects is recommended as an addition to FCGMA policies.

With regard to other as aspects of this comment, there are two points of clarification. First, no actual pumping of poor-quality shallow groundwater has been authorizes by the FCGMA to date without an existing allocation. Resolution No. 98-1 provides for construction dewatering without an established allocation since such work is typically short-lived and occurs in the shallow subsurface. Resolution No. 99-3 allowed for unrestricted pumping of "mounded groundwater" within the Oxnard Plain Forebay Basin without an allocation, but only under very specific terms and conditions that to date, have never been met or authorized. Second, the Board **has not**, in fact, approved any plan for pumping without allocation in the South Las Posas Basin although the Board is willing to consider the submittal of a plan. Specifically, Resolution No 2003-03 states that "an allocation for pumping from the South Las Posas Basin may be changed or altered to accommodate a responsible entity that submits a plan to render this groundwater usable"[*] To date, no specific plan has been approved through ordinance or resolution by the Board.

***11**. **Camarillo's Comment**: The last 3 paragraphs on page 23 (June 2006 Draft Plan) discuss groundwater extraction reduction. The numbers presented in the second paragraph in this Section indicates that the total reduction in pumping is about 22 to 23 percent. The next paragraph indicates that the largest decrease in pumping is from agricultural uses, while the last paragraph indicates that the first phase of the FCGMA enforced pumping reductions of 15 percent resulted in the reduction of 8,300 acre-feet of pumping by the M&I users. However, the discussion on the reduced pumping does not appear to reflect the transfer of allocation from agricultural uses to M&I service, or the fact that while some M&I providers are using all their allocation, others have been conserving them for conjunctive use with other sources. We believe that the apparent 15 percent reduction in pumping is somewhat coincidental and that the overall M&I allocation for groundwater use has increased substantially due to land use conversion.*

Recommended Action: This discussion should compare the changes in acreage irrigated and M&I acreage served over the same time period that pumping reduction has occurred. This may also be the place to discuss the likelihood that under recording meters, or agricultural wells with no meters at all, may be contributing to the apparent reduction in reported agricultural pumping.

Response to Camarillo's Comment #11: The discussion of groundwater extraction has been expanded significantly and is located in Section 4.0 of the final Plan. The issue of potential under-reporting of groundwater extractions is addressed in Section 10.1.6 and Section 11.3.9 of the final Plan. In addition, an additional modeling scenario was performed to address potential under-reporting of groundwater extractions. A discussion of the results is provided in Section A.2.2.2 of Appendix B.

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[*] FCGMA, 2003. Item 4: Minutes of the October 22, 2003 Board Meeting *in: Full Agenda for the December 17, 2003 FCGMA Board Meeting.*

***12. Camarillo's Comment**: The second paragraph of page 52 (June 2006 Draft Plan) implies that there is a universal acceptance of the pumping reductions and the stiff penalty for over pumping. The City of Camarillo doesn't agree that there is a universal acceptance of the pumping reductions. It is the City's view, as well as other M&I users, that the reduction is not equitable and recommends that the efficiency policy be reviewed in conjunction with production meter testing activities.*
Recommended Action: Consider revising the text to indicate there may be general acceptance of the pumping reduction policies but not universal agreement. The reduction policies should consider equal distribution in sharing the burden in resolving water level deficits in the basins.

Response to Camarillo's Comment #12: The language has been revised to reflect general, but not universal, acceptance of mandated or scheduled Historical allocation reductions.

***13. Camarillo's Comment**: The third paragraph on page 59 (June 2006 Draft Plan) states that the baseline allocation is two acre-feet per acre. The City of Camarillo understands that the two acre-feet per acre may have been the historical allocation, not the baseline allocation. Baseline allocation is only one acre-foot of water per acre, and should be considered when analyzing the baseline allocation policies.*

Response to Camarillo's Comment #13: The baseline allocation number as stated has been corrected to one acre-foot per acre as provided by Section 5.6.1.1 of FCGMA Ordinance No. 8.1.

1*4. Camarillo's Comment:* *Page 63 (June 2006 Draft Plan) provides a discussion on the potential effectiveness of importing additional state water. Further clarification of this paragraph would be very helpful in understanding this potential strategy.*

Response to Camarillo's Comment #14: A discussion of the potential effectiveness of importing California State Water is provided in Section 10.2.2 of the final Plan. The potential effects of importing California State Water was also addressed as a model scenario using the VRGM and is discussed in Section A.2.2.7 of Appendix B.

***15. Camarillo's Comment:** Page 73 (June 2006 Draft Plan) provides a discussion on penalties used to purchase replacement water. It should be noted that a large percentage of overpumping is by agricultural users who have the ability to escape penalties by switching to irrigation efficiency and consequently the revenue from these fees has historically been very little. Therefore, using this revenue to purchase replenishment water may be of little benefit to the basins.*

Response to Camarillo's Comment #15: The comment is noted.

1*6. Camarillo's Comment:* *Page 79 (June 2006 Draft Plan) includes a Section on "Extractions of Poor-Quality Water Without an Allocation", which would be an addition to current FCGMA policy. The City of Camarillo supports such a strategy that allows projects that would benefit the overall aquifer system. The City of Camarillo would like to see this policy implemented and would appreciate the opportunity to review the draft policy.*

Response to Camarillo's Comment #16: Please see the response to Camarillo's Comment #10 above.

***17. Camarillo's Comment:** FCGMA has reduced pumping and approved projects that provide some benefit to some portion of aquifers within the agency boundaries. However, this does not promote the implementation of projects in critical areas of the basin that are just outside of agency boundaries. Before implementing the next stage of pumping reductions on M&I users, the City of Camarillo recommends that the FCGMA evaluate larger picture projects* *that could help solve groundwater impacts in the most critical areas and potentially provide solutions in-lieu of additional pumping reductions. Further pumping reductions could possibly be avoided if the current basin by basin management approach was revised and strategies were implemented based on the principal that downstream basins are impacted by upstream uses and that the impact is therefore created by both agricultural and M&I users who pump from all basins.*

FCGMA could consider implementing a "mitigation fee" of approximately $10/AF that would be paid by all groundwater users in the FCGMA. This strategy would allow funding for agencies like UWCD, Oxnard, or Calleguas MWD to develop projects that would effectively improve the conditions of the basins as a whole by moving water to over pumped areas within FCGMA boundaries. This approach would help prevent basin by basin management which could inordinately impact users in downstream basins, like the City of Camarillo.

Response to Camarillo's Comment #17: Section 11.1 of the final Plan proposes that there be a dialog on strategic planning within the water community that would discuss specific projects and project proposals. FCGMA staff has proposed a Plan implementation strategy that not only provides for, but encourages, significant stakeholder contribution and input. There are some inherent limitations to the influence of the FCGMA. The enabling legislation for the FCGMA limits its ability to influence projects and conditions outside its boundary. The opportunity to expend FCGMA funds outside its boundary is also limited.

18. Camarillo's Comment: *The City of Camarillo is under the impression that there is a quantifiable amount of groundwater being exported outside the FCGMA boundary from Pleasant Valley and Las Posas Basins. The City of Camarillo would recommend that FCGMA pursue controlling the exportation of groundwater before additional pumping reductions are approved.*

Response to Camarillo's Comment #18: The exportation of groundwater outside the FCGMA boundary is addressed in Section 9.4.

19. Camarillo's Comment: *The Draft GMP indicates that FCGMA is considering expiring accumulated groundwater credits. It should be noted that M&I users conjunctively balance surface water and imported supplies with local groundwater thereby conserving groundwater for use when surface and imported supply is not available. Therefore, setting a time limit on credits works against this water supply management philosophy. Credit reduction is an issue that should be reviewed separately for M&I uses and agricultural uses. Similar to implementing 25 percent pumping reductions, credit reductions would only impact M&I agencies who conduct long-term planning, since agricultural users could go on efficiency allocation and would not be impacted by a loss of credits. M&I users do not have this option.*

In regards to agricultural credits, please note that UWCD surface water deliveries have in part allowed accumulation of credits by agricultural users that receive surface water for irrigation. Those who funded the Freeman Diversion have in part funded the accumulation of these credits when surface deliveries were annually increased. The credit reduction strategy is believed to be of very little benefit to the overall basins but would have a significant impact to M&I users. If there is a desire to eliminate the perceived "groundwater debt", agricultural credit reduction should be the first consideration.

Pages 71 and 72 (June 2006 Draft Plan) state that there are tens of thousands of acre-feet of accrued conservation credits. The credits that the City of Camarillo has accrued came at a high cost, when we purchase more expensive imported water. Poor quality groundwater has forced the City of Camarillo to blend groundwater with imported supplies, subsequently accruing groundwater credits. The City of Camarillo intends to retain its credits until such time they are needed to meet demands during a drought. Even though credits cannot be *sold, they have a value to M&I users that is equal to the over pumping surcharge. FCGMA should reconsider the proposed strategy of expiring/reducing M&I groundwater credits.*

Response to Camarillo's Comment #19: The issue of M&I accrual of credits as well as the "shelf-life" for conservations credits is discussed in extensive detail in Section 10.1.13 of the final Plan.

20. Camarillo's Comment: *Page 73 discusses proper filling and capping of abandoned or leaking wells and states that FCGMA helps with the costs associated with well abandonment. The owner of the land that the well is on should be responsible for costs associated with destruction of well(s).*

Response to Camarillo's Comment #20: It is true the owner of the land is responsible for well destruction. Historically, the City of Oxnard, United Water, and the FCGMA have each provided funding to destroy wells for a variety of reasons including urgency, difficult access, threats to water supply, and inability to find former owners. The Ventura County Watershed Protection District - Groundwater Section has pursued the destruction of 40 to 50 abandoned wells per year over the last several years at the property owner's expense without FCGMA financial assistance.

21. Camarillo's Comment*: Page 75 (June 2006 Draft Plan) provides a discussion of additional reductions in pumping allocations. It is recommended that further reductions not be implemented until after the meter testing effort is complete. Perhaps FCGMA should require an initial testing of all meters within one year. This would be very beneficial to the modeling effort because the model will only be as accurate as the information used to develop it.*

Response to Camarillo's Comment #21: The groundwater management strategy of reducing extraction allocations is discussed in extensive detail in Sections 9.5, 10.4.1, 11.2.1, 11.3.10, and Appendix Section A.2.2.3 of the final Plan. The verification of extraction reporting is discussed in detail in Sections, 10.1.6, 11.3.9, and in Appendix Section A.2.2.2. Many different and independent analyses performed over the last four years as well as years of historic documentation demonstrate nearly all of the aquifers of the FCGMA are in a state of overdraft. Two FCGMA Staff reports prepared since October 2006, the *FCGMA 2005 Annual Report*, the output of the VRGM (Appendix B to the final Plan), and the UWCD's *2003 Coastal Saline Intrusion Report, Oxnard Plain Ventura County, California* universally identify extraction of groundwater beyond a level the resource can support as the sole reason for depressed groundwater elevations, seawater intrusion, and water quality degradation throughout the FCGMA. Thus, there is an urgent need to implement strategies that both limit use of the resource and provide additional sources of acceptable recharge. While the increased accuracy of extraction reporting may indirectly contribute to better management of the groundwater resource, the overwhelming body of data and analysis supports the conclusion the resource as whole is over-allocated and overused. Delaying the implementation of any strategy that either reduces overuse of the resource or limits the acquisition of additional recharge does not serve either the FCGMA or its stakeholders. Nevertheless, further extraction reduction will be considered in conjunction with other management strategies described in the Plan with the overarching purpose of comprehensively managing the groundwater resource.

FCGMA responses to written comments provided by:
Mr. Lawrence (Larry) Fuller
Land Owner/Well Operator in the FCGMA
Somis, CA

1. ***Fuller's Comment:*** *Examining the FCGMA Management Plan in light of the case CITY OF BARSTOW et al, v. MOJAVE WATER AGENCY (21 August 2000), I believe this case clarifies the California Supreme Court's position on water rights. It is my understanding that the FCGMA used the "equitable" (physical) concept for allocation pumping to all of the Fox Canyon aquifer pumpers. This method of allocation is clearly a violation of the law, if I understand the ruling cited above. The three levels of priority, as stated in the case law, are 1st priority Overlying Owners, 2nd in priority are Appropriators, and 3rd are Exporters. Thus, while the rights of all overlying owners in a groundwater basin are correlative, and subject to cutbacks when the basin is overdrafted, overlying rights are superior to appropriative rights. It is my request that the FCGMA Board of Directors NOT make any further pumping reductions until these legal issues can be resolved. Small water users, Co-ops, and small M&I agricultural systems are not addressed specifically in the Management Plan. In addition, the FCGMA Board has no small operation representative to ensure that their interests and concerns will be heard.*

Response to Fuller's Comment #1: The history and responsibilities of the FCGMA are summarized in Section 2.0 of the final Plan.

The Agency was created by the State Legislature in 1982 [AB 2995] and granted with certain powers and authority to manage groundwater resources. Included in its enabling legislation (now codified as California Water Code Appendix Chapter 121) is the directive to develop, adopt, and implement a plan to control groundwater extractions (Sect 601). It was also granted the power to "Control extractions by regulating, limiting, or suspending extractions form extraction facilities…" [Ch. 121 Sect. 701 (b)]; and the power to "Impose reasonable operating regulations on extraction facilities…"[Ch. 121 Sect. 701(c)]. SB 747 (1991) amended AB 2995 and authorized the FCGMA Board to establish extraction allocations and levy charges for groundwater extraction. Neither the final Plan nor the FCGMA Ordinance No. 8.1 address the issue of water rights, which is beyond the scope of the FCGMA.

The final Plan was prepared to address the future management of the groundwater resource with respect to the needs of all of the FCGMA stakeholders, regardless of size. Since the operational impacts of larger users have a greater impact on the common resource, some priority has necessarily been placed on strategies that effect large-scale extraction or recharge operations. However, almost all of the proposed groundwater management strategies either directly or indirectly affect all users.

With respect to the comment regarding representation, two of the five FCGMA Board positions are established to represent agricultural operators and small water districts.

2. ***Fuller's Comment:*** *According to my understanding, the Calleguas Municipal Water District (CMWD) has been allowed to acquire Fox Canyon aquifer prescriptive pumping rights. The Board has already allowed the injection wells to be drilled and injection of imported water is progressing. It is imperative that CMWD be restricted in writing that they will not be allowed to extract water outside of their injection field.*

Response to Fuller's Comment #2: A discussion of the Las Posas Basin ASR project as well as other proposed aquifer storage projects, a preliminary set of proposed conditions is provided in Section 9.1 and Section 10.1.10 of the final Plan. Specific aspects of the East Las Posas Basin ASR (formerly Identified as the North Las Posas Basin ASR) are provided in Appendix Section A.3.1 of the final Plan.

The FCGMA has no authority in either its enabling legislation or through its Ordinance code to grant prescriptive rights. When the FCGMA Board authorized and approved the East Las Posas Aquifer Storage and Recovery Project (or ASR Program) proposed by CMWD back in February 1994, certain restrictions were placed on both the operational limitations and the water quality alterations that could result. A written list of conditions was attached to the general injection permit authorized by the FCGMA that included but were not limited to volume reporting, monthly water quality reports, water quality restrictions for both imported water and extracted water, total storage limitations, vicinity groundwater conditions reporting requirements, as well as other standards and condition-dependent response actions (Appendix Section A.3.1 of the final Plan). A copy of these standards or conditions is available and included in an official policy sheet entitled “GMA Adoption of Water Quality Standards.”

3. Fuller’s Comment: *A gallon for gallon or acre-foot for acre-foot of water injected for water extracted allowance associated with the CMWD ASR field should take into account the wetting factor of the dry sands and the drift factor of the water moving through the aquifer. Fluid losses can be substantial due to wetting of a dry formation and losses via underflow out of the basin or injection area. The FCGMA should not be providing free water to CMWD.*

Response to Fuller’s Comment #3: The comment regarding the equity of credits for injected water compared to extracted water is addressed in Section 9.1 and Section 10.1.10 of the final Plan. This is one of the many issues to be considered as part of implementation of all FCGMA groundwater management strategies.

4. Fuller’s Comment: *The court cases cited should be discussed in detail and rights of prescription should be examined as they might apply or effect FCGMA ordinances, processes or procedures especially in light of recent rulings by the court.*

Response to Fuller’s Comment #4: The Agency Counsel, supplied to the FCGMA under contract with the County of Ventura, reviews and provides legal counsel to the Staff and the Board for all decisions, Ordinances, and resolutions with respect to County, State, and Federal Codes. Historically, the Agency has also contracted external legal services to provide advice on both policy and legal issues.

File: GMP
Comments Received

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Robert J. Saperstein
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June 22, 2006

Via Electronic Mail

AUG 2006
Received
Fox Canyon
GMA

Fox Canyon Groundwater Management Agency
c/o Dr. Steve Bachman
800 South Victoria Avenue, L#1600
Ventura, CA 93009

Re: Comments on Draft Groundwater Management Plan

Dear Steve:

These comments are provided on behalf of the cities of Oxnard and Camarillo, and Crestview Mutual Water Company. Many members of the GMA's M&I Providers Group have also reviewed these comments, but given the short time available, this letter has not been endorsed by any entities other than those listed above.

The M&I Providers group is committed to working with all the interested parties in ensuring that the final, updated GMA Groundwater Management Plan is well-done. The product must be comprehensive, technically well-grounded, and accessible to all the various GMA constituents. This is not a simple task.

GMA staff is also aware that the M&I Provider's Group has hired Curtis Hopkins to provide a peer review of the Management Plan. Curtis and Steve Bachman have already discussed ways in which they might collaborate in making the product meet all our expectations.

The first rough draft presented on June 12, 2006, provides an excellent starting point. Given that this initial draft does not contain the results of the modeling work, these comments are purposely general. When the modeling effort yields results, and the Management Plan is then crafted with more specific recommendations, more specific comments will be provided.

The M&I Providers Group also wanted to express its appreciation for the first workshop conducted on June 15, 2006. It is clear that Steve and the GMA staff have a good plan to ensure that the GMA constituents who chose to be involved will have ample opportunity to influence the content of the plan.

Fox Canyon Groundwater Management Agency
June 22, 2006
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In no particular order of importance, please consider the following observations and comments regarding the first draft of the Management Plan and the process in getting it completed:

1. GMA Board attendance at the workshops. While we understand the time commitment is extensive, this update to the Management Plan is very important. It will guide GMA policy and decision-making for years to come. We are not sure how the GMA Board can obtain adequate familiarity with all the issues and the constituents' concerns without some attendance at the workshops. No board members attended the first workshop.

2. Executive Summary. This section is written as part introduction and part summary. An Executive Summary is normally drafted when the remainder of the document is complete. Given the length and technical nature of the material, the Executive Summary will be the most important section of the Plan. It may be the only portion of the document many individuals read. It should summarize the purpose, issues and recommendations, once all of the technical work is complete.

3. Acknowledgements. Throughout the document, there is repetitive recognition of United and Calleguas as the two entities who contribute to the GMA. This recognition is limited almost exclusively to these two entities. Either this self-congratulatory language should be eliminated, or there should be proper acknowledgement of the work of all the individuals and agencies who have and continue to contribute to the GMA's success.

4. Modeling. There needs to be a distinct section that better describes the model details used for the technical analysis. This section need not be long, but it should include mention of the software, construction, assumptions and details of the model construct. It ought to give enough information for the technically capable reader to understand its basics.

5. Organization and Redundancy. There is tremendous redundancy in the report. Perhaps with different organization, it could be slimmed down significantly. You might describe the water quality and quantity issues generally applicable to all areas, along with the general concept of basin management objectives. Then discuss all the issues comprehensively, separated for each basin or in some cases regions with multiple basins. As an alternative, some of the nonessential background and detailed technical information might be moved to appendices.

6. Management Strategies: Organization. In a fashion, the Management Plan is really several separate management plans. Perhaps it should be organized by basin for the three content subjects: strategies under development, future strategies and actions to attain BMO's. There may need to be one more general section that addresses those strategies that cross basin boundaries. You may be able to combine all the basin specific discussions in one section for each basin. A couple different organizational approaches might be tested, with the goal of reducing redundancy and volume of text.

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7. Specific strategy: Forebay priorities. The potential over-reliance on the Forebay under certain conditions is acknowledged in the document. However, there is no mention of the importance, from a policy perspective, to establish some hierarchy for use of the Forebay. There will be increasing reliance on the Forebay. To the extent access to the Forebay may be limited under certain conditions; the GMA board must consider limiting certain uses before others.

8. Specific strategy: Transfers across basins. There is no direct mention that transfers (of allocation or credits) from challenged areas to areas of abundance may be the simplest method of mitigating problems. This has been a policy not favored in the past. However, this is an appropriate time to reconsider this question, particularly if the technical analysis suggests that a surgical approach is required to solve certain problem areas.

9. Specific strategy: Ag recycled water use. The draft Plan acknowledges (assumes) that larger volumes of recycled water will be available for Ag use in the future. The assumption is correct that highly purified recycled water will be available and recycled water use could be a very efficient method of solving several regional problems. However, there is some resistance in the Ag community to take direct use of recycled water. The resistance is not over the quality of the recycled water, but over the required reporting to distributors and product buyers that the crop was grown with recycled water. As long as there is the Ag industry perception that recycled water use may harm the user's competitiveness, recycled water will not be widely accepted. The Board may be able to help influence certain industry groups to alter the current reporting requirements that create these problems for individual users.

10. Analytic methodology. There appears to be no intent to model the expected (inevitable) conversion of Ag use to M&I use over the period of the modeling run. Without this detail, the modeling exercise may provide very misleading results. For example, there are several significant Ag to M&I projects that are in the planning stages located in the south Oxnard Plain area, nearby the City's wastewater treatment plant and the military bases. The result of these conversions will be a shift in groundwater use from wells in a highly sensitive area, to City and United wells located far from the coast (and imported water). If the model does not take into account these expected transitions, it will predict a materially different future than that which will occur. In this fashion, the modeling results may be very misleading.

11. Water quality. It is somewhat troubling that the cornerstone of the Plan is the setting of Basin Management Objectives, some of which are water quality objectives. However, the model has no capability to predict water quality changes. Thus, we need to be very careful in how we set and monitor compliance with the Basin Management Objectives.

12. Periodic update. Either as a component of the Plan, or as a Board measure in adopting the Plan, there should be a built in requirement to update the Plan no less than every 5 years. This should not be so difficult if the model proves to be as useful a tool as is expected.

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13. A few detail comments (there are several other nits in the document that we assume will be fixed in future drafts):

a. Pg. 12. There is no such thing as "in-lieu" credits. Ordinance 8 only defines storage and conservation credits. There are special credit transfer agreements/programs the GMA has approved that amount to "in-lieu" transfer of credits, but the term has no meaning in Ordinance 8.

b. Pg. 12. Ordinance 8 requires Ag to demonstrate 80% efficiency, based on the individual crops grown. The Plan does not propose tightening the efficiency percentage as a potential method of reducing water use. Also, the current reporting requirements are not clear in requiring that the efficiency calculation is to be based on irrigated acreage, not total owned property. In some cases, the irrigated acreage may be materially smaller than the property footprint. In that circumstance, the user gets a substantial benefit in reporting efficiency based on the property footprint instead of the irrigated acreage.

c. Pgs. 13, 16. There is no mention of M&I return flows as a source of recharge.

d. Pg. 20. Two different definitions of basin yield are used and overdraft is not defined.

e. Pg. 23. The discussion of the decreasing trend of extractions is incomplete and therefore misleading. As to the Ag side: (1) there is no quantification of the reduction of Ag pumping resulting from reduced acreage in production over the past two decades, and (2) there is no recognition that the initial period against which we are measuring reduced usage was a very dry period. During dry periods, Ag groundwater use tends to be greatest. Since those early years, we have been in a generally wet period. Thus, we would expect a natural reduction in Ag groundwater use simply based on the historical hydrology.

As to the M&I side, there is no quantification of the increase in municipal demand as a result of conversion of Ag use to M&I use. There is no discussion of the relative efficiencies of use of water prior to the imposition of the cutback goals. The implication of the current discussion in the Plan is that Ag has done more than its share and M&I has not. There is insufficient information or analysis for this conclusion or implication. This discussion should either be made complete and correct, or eliminated, especially if policy decisions might be influenced by it.

f. Pg. 29. The discussion of increasing salt concentrations in the Las Posas basins is somewhat conclusory and incomplete. It might help to actually provide the POTW discharge water quality for TDS and chlorides, so that it would be more clear to the reader that the problem is, in fact, generating from aquifer conditions, not discharge water quality.

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The M&I Provider's Group and Curtis Hopkins will continue to be very actively involved in finalizing the Plan. We appreciate the Board's instructions to develop the Plan in an open and interactive environment. Thank you for your consideration of these comments and those that are certain to follow.

Best Regards,

Robert J. Saperstein
For HATCH & PARENT
A Law Corporation

ROB:olr

cc: Board of Directors of Fox Canyon Groundwater Management Agency
Jeff Pratt
David Panaro
M&I Provider's Group

SB 395545 v1:006670.0041

PUBLIC WORKS DEPARTMENT
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16 August 2006

Transmitted Via Electronic Mail

AUG 2006 Received Fox Canyon GMA

Fox Canyon Groundwater Management Agency
c/o Dr. Steve Bachman
800 South Victoria Avenue, L#1600
Ventura CA 93009

Subject: Additional Interim Comments on Draft Groundwater Management Plan

Dear Dr. Bachman:

This letter sets forth additional interim general comments on the Draft Fox Canyon Groundwater Management Agency ("FCGMA") Groundwater Management Plan ("Plan") and the current planning process by the City of Oxnard. A draft of this letter and the substantive comments herein were also discussed at the Municipal & Industrial ("M&I") Providers Group meeting on 15 August 2006. Those in attendance expressed their general support for the recommendations set forth below. We will provide more specific comments when the results of the basin model become available. We understand that the modeling results will be available by the end of this month, and that the draft Plan will be amended to include specific recommendations based upon the results. The M&I Provider's Group and its consultant, Hopkins Groundwater Consultants, will need sufficient time to review the model results and the revised draft Plan when available, so that we can provide meaningful comments.

As an interim effort, we are submitting these additional comments to supplement the comments provided by the City of Oxnard and others by letter, dated 22 June 2006. Our additional interim comments are as follows:

1. At the last workshop on the draft Plan, the group discussed the potential that incorrect assumptions about the quantity of groundwater production could result in erroneous outcomes from the model. Indeed, there is substantial anecdotal evidence that groundwater production reporting may be materially incorrect because of inaccurate meters or other faulty reporting mechanisms. For this reason, we recommend that the model be run to assume a band of uncertainty relating to the quantity of groundwater production within FCGMA. Such sensitivity analysis will help verify the integrity of the model results.

Fox Canyon Groundwater Management Agency
16 August 2006
Page 2

2. As a related matter, the FCGMA will pursue an aggressive review of meter calibrations over the next several years. However, this process is not scheduled to start until 2007 and it will take three years to complete the first cycle. We recommend that the model be periodically rerun and updated with this new, more accurate production data when it becomes available. In the interim, we recommend that FCGMA staff review suspect accounts and perform a preliminary audit of groundwater production reporting to determine the scope of potential discrepancies.

3. The Draft Plan sets forth several potential future management strategies that should be further explored for their potential effectiveness in addressing seawater intrusion and other adverse hydrogeologic conditions. We recommend that the next draft of the Plan prioritize these potential future strategies in terms of their potential effectiveness. We further recommend that the FCGMA develop procedure to apply a cost/benefit analysis to determine which of the prioritized strategies should be implemented.

4. As a general matter, we also encourage the FCGMA to consider more dynamic use of aquifers with dewatered storage space as a potential resource for future conjunctive use programs. Other basins, such as the Chino and Orange County basins, are currently planning and using available dewatered storage space for local and regional conjunctive use programs that yield better water supply reliability and financial benefits to support other necessary basin management programs. The FCGMA could pursue similar programs. There are numerous hydrogeologic and policy matters that must be resolved to implement a large scale groundwater storage program. Still, we recommend that the Plan include additional and more detailed discussion of potential opportunities for active conjunctive use programs within the FCGMA area.

We look forward to viewing the model results and the next iteration of the draft Plan so that we may provide more specific comments. As we noted in our prior letter, we appreciate the open and interactive environment in which this planning effort is being conducted. Thank you for your consideration of these additional interim comments.

Sincerely,

Anthony A. Emmert
Water Resources Manager

cc: Board of Directors, Fox Canyon Groundwater Management Agency
Jeff Pratt
Gerhardt Hubner
David Panaro
M & I Providers Group

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August 16, 2006

Mr. David Panaro
Fox Canyon Groundwater
Management Agency
800 S. Victoria Avenue
Ventura, CA 93009

Re: Draft Goundwater Management Plan

Dear David:

Pleasant Valley County Water District ("PVCWD") has reviewed the Fox Canyon Groundwater Management Agency (GMA) Draft Groundwater Management Plan. The staff of the GMA and their consultants are to be congratulated on their efforts in drafting this comprehensive document. We continue to believe that the best way to address our groundwater issues in Ventura County is the consensus building approach that the GMA has always embraced. In our review we have several initial comments. Our comments are made sequentially based upon the GMA draft.

1. On page 23, under the section "*Groundwater Extractions*", in the third paragraph it refers to increased agricultural efficiencies. We believe that somewhere in this paragraph reference should be made to the fact that extractions from the groundwater may have also decreased because increased yields from the Freeman diversion and the Conejo Creek project.

2. On page 43, in the section entitled "*Assessment of Basin Management Objectives*", in the second paragraph it refers to BMOs for groundwater levels in the Pleasant Valley basin. In table 3, it makes reference to Basin Management Objectives in the Pleasant Valley area. but does not set forth what the current levels are, it would be helpful to state the groundwater BMOs.

3. On page 48, under the section "*Contingency Plan for LAS Seawater Intrusion*", it states that the GMA staff has developed a contingency plan to address the intrusion of seawater into the LAS. It would be helpful if drafts of that Contingency Plan could be made available for public review.

Mr. David Panaro
Fox Canyon Groundwater
Management Agency
Re: Draft Goundwater Management Plan
August 16, 2006
Page 2

4. On page 50, under the section "*Conejo Creek Diversion Project*", the last sentence references that over the "net 20 years" that the yield of the diversion might decrease. There obviously is a spelling error there in that the word "net" should be "next". Furthermore, input should be sought from Camrosa Water District to determine whether or not their proposed plans will in fact reduce yield to Pleasant Valley. In discussions with Richard Hajas, it is our understanding that Camrosa's intent is to continue to provide current levels of diverted water to Pleasant Valley and in fact yields may be increased.

5. On page 55, under the section "*Great Project (Recycled Water)*", the first paragraph makes reference to the delivery of recycled water to the Pleasant Valley area. Pleasant Valley has continued to express their concerns to the City of Oxnard about the suitability of the recycled water for agricultural use. In particular, Pleasant Valley is concerned about the "stigma" that recycled water has in the market place. Many growers are now required to provide information on the source of their irrigation water. In the event that recycled water is used, the agricultural produce is often downgraded.

   Also, Pleasant Valley has concern about the injection of recycled water into the LAS. Injection into the LAS is discussed on pages 65 and 66. Because the LAS is the only groundwater source for the Pleasant Valley County Water District, Pleasant Valley will closely scrutinize any injection of recycled water into the LAS.

   We feel that a better alternative to injection would be the transportation of the recycled water to the spreading grounds. This would enhance recharge and remove concerns relative to injection.

6. On page 59, under the section "*Non-Export of FCGMA Water*", the last paragraph on that page states "It appears that current ordinances and policies of the FCGMA are sufficient to deal with its export issue." In light of recent issues, the ordinances of the GMA should be reviewed again to make sure that they are adequate to address the export issues. In particular, the enforcement provisions relating to export of "GMA" water should be closely reviewed.

7. On page 63, under the section "*Increase Diversions from Santa Clara River, Potential Effectiveness*", the first sentence states "The Santa Clara River remains a primary recharge source for the Oxnard Plain and Pleasant Valley basins." Based upon our understandings of various studies, it is a little misleading to suggest that the Pleasant Valley basin gets much recharge from the Santa Clara River. Although there may be some recharge, even that is disputed, it is clear that the amount of recharge is minimal at best.

Mr. David Panaro
Fox Canyon Groundwater
Management Agency
Re: Draft Goundwater Management Plan
August 16, 2006
Page 3

8. Beginning on page 71, under the section "*Shelf Life for Conservation Credits*", it is Pleasant Valley's opinion that at the present time there is no need for "sunsetting" of conservation credits. While conservation credits have been built up by not only Pleasant Valley, but other entities, it was the very purpose of allowing for conservation credits so that the credits could be retained and used for future needs. Pleasant Valley sees no present need to "sunset" the conservation credits. Credits would only be used when there was inadequate surface water from the Freeman Diversion and the Conejo Creek Project, and pumping from our wells were insufficient to meet our needs. Putting a shelf life on credits seems to suggest that Pleasant Valley would utilize their credits to over pump and waste water.

It is also our opinion that putting a shelf life on credits, will also remove incentives to look for creative water solutions. For example, much of the impetuous for Pleasant Valley to participate in the Conejo Creek Project, was the fact that credits would be generated.

We appreciate the opportunity to provide our comments concerning the draft, and look forward to the further development of the plan.

Very truly yours,

ARNOLD, BLEUEL, LAROCHELLE,
MATHEWS & ZIRBEL, LLP

John M. Mathews

JMM/ksvk
cc: PVCWD
S:\USER\SHARE\P\PVCWD\Correspondence\Panero 8-16-06.wpd

August 17, 2006

Fox Canyon Ground Water Management Agency
Ventura County Government Center Administration Building
800 South Victoria Avenue
Ventura, California 93009-1600

Attention: Mr. Lynn E. Maulhardt, Chair

Subject: Comments on the Public Review Draft Updated Management Plan dated June, 2006

Dear Mr. Maulhardt:

Saticoy Country Club (SCC) has a vested interest in the proposed changes to the current Fox Canyon Groundwater Management Agency Management Plan (Management Plan Update) but we have not been able to complete our comments in time for the August 21, 2006 deadline for comments. While this letter presents our early thoughts on several issues in the draft Management Plan Update, we intend to continue our effort to prepare comments. Our goal is to have our completed comments shortly after the next FCGMA Groundwater Management Plan Workshop on August 31, 2006. With this schedule we trust our comments will be considered for incorporation in the Final Management Plan Update.

SCC has significantly reduced our water usage through a reduction in irrigated acreage and increased our efficiencies through infrastructure improvements and our water management practices including the following:

- Hired a golf architect to provide a plan to reduce our irrigated acreage from about 117 acres to 95 acres.
- Implemented the 95 acre plan.
- Hired a landscape architect to prepare a drought resistant landscape plan.
- We are in the process implementing the landscape plan.
- Converted many sprinkler heads to more efficient one half head models along the edges of the fairways.
- Rewired each of our sprinkler heads and installed new sprinkler controls for improved individual run time controls.
- We have on-going turf grass studies for additional efficiency improvement.
- A complete irrigation system upgrade evaluation is planned within the next few years.

For the draft Management Plan Update we have identified two areas so far that warrant comments. Those are:

Continuation Of 25% Pumping Reduction

SCC supports all efforts to bring the basins into safe yield and we not only have committed to reduce our overall pumping but we also have committed significant capital resources to increase our efficiencies. As briefly described above we have made a significant efficiency effort already through our infrastructure alterations and water management practices and will continue that effort in the future. As such it is our opinion that to continue the phased reductions to the full 25% reduction (with possible further reductions) only to M&I users is unfair and that the Draft Management Plan Update should either include provisions to reward increases in efficiencies by M&I users and/or to implement additional productive measures to also reduce agricultural pumping.

SATICOY COUNTRY CLUB

4450 NORTH CLUBHOUSE DRIVE
SOMIS, CALIFORNIA 93066
(805) 485-4956
FAX (805) 647-1158

Agricultural users consume far more of the resource and it is completely unfair to place the burden of balancing the basin on the M&I users.

Shelf Life For Conservation Credits

We understand the potential concerns of accumulating Conservation Credits with no expiration date and that this accumulation effectively has left a large theoretical pumping debt on the aquifers. Sunset provisions may be warranted in many cases. Our initial concerns with this proposed provision alteration is how it may impact different size users and also the potential for removal of credits earned through our continued efficiency improvements.

We look forward to discussions on both of these issues in the workshops.

Sincerely,

John R. Powell. RG, CEG
For the Water Committee

City of Camarillo

601 Carmen Drive • P.O. Box 248 • Camarillo, CA 93011-024

Public Works
(805) 388-5380

August 25, 2006

Mr. Jeff Pratt, P.E.
Executive Officer
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009

Subject: Comments to Fox Canyon Groundwater Management Agency Draft Groundwater Management Plan (June 2006)

Dear Jeff,

The City of Camarillo, and its consultants, Black & Veatch and Hopkins Groundwater Consultants, Inc., have reviewed the June 2006 Draft Groundwater Management Plan (Draft GMP) prepared by your agency, and attended two Agency workshops. Based on these interactions, we offer the following comments and recommended actions.

<u>Comments Regarding Development of Brackish Groundwater</u>

The Draft GMP provides discussion in several locations regarding the potential feasibility of the development of the brackish groundwater supply in the northern portion of the Pleasant Valley Basin. The following comments are in regards to this subject.

1. Comment: Page 58 indicates the following, *"the City of Camarillo is considering a strategy to move some of its current pumping from the area of the LAS pumping depression beneath Pleasant Valley to this area of poorer-quality rising groundwater. Under this plan, the poorer-quality water would be extracted and desalted in a similar manner to the South Las Posas Basin project approved by the FCGMA."*

   Recommended Action: Consider replacing this text with the following, "*The City of Camarillo has assessed the feasibility of constructing a Groundwater Treatment Facility that* *would be located in the Somis Gap area of the Pleasant Valley Basin (Black & Veatch, August 2005). The study determined the project to be technically feasible and would allow Camarillo to halt pumping from an area of the LAS with depressed groundwater levels and instead pump in an area of rising groundwater levels. This plan is similar in nature to the South Las Posas Basin project, which was previously approved by the FCGMA Board and consistent with policy to move pumping to areas of known substantial recharge (i.e., Oxnard Forebay) which will create more storage space for future recharge events. The City of Camarillo proposes to coordinate pumping strategies between various stakeholders in the neighboring sub-basins in order maintain replenishment of the Pleasant Valley Basin."*

2. Comment: The majority of the discussion on page 58 focuses on the development of brackish groundwater in the LAS of the Pleasant Valley Basin by means of Camarillo's Groundwater Treatment Facility project. However, the third paragraph awkwardly mixes in a brief discussion of an alternate subject in an area of the Pleasant Valley Basin that is far away from the observed recharge in the forebay.

   Recommended Action: Please elaborate on the significance of this paragraph to Camarillo's Groundwater Treatment Facility Project or relocate this paragraph to an alternate location to maintain the continuity of the discussion regarding Camarillo's Groundwater Treatment Facility project which is in the forebay.

3. Comment: Page 17 provides the following description of the Pleasant Valley Basin, *"Despite the fault barrier to the west, the LAS is in hydrologic continuity with the adjacent southern portion of the Oxnard Plain Basin, which is the primary recharge source for the Pleasant Valley Basin."*

   Two paragraphs later, the following is stated, *"At the northeast edge of the Pleasant Valley basin, where Arroyo Las Posas flows cross the basin boundary, increased flows in the arroyo have apparently percolated directly into the LAS, significantly raising groundwater levels in City of Camarillo wells. This recharge suggests that this portion of the Pleasant Valley Basin is unconfined, contrary to current understanding of the basin."*

   Recommended Action: Consider the following definition of the Pleasant Valley Basin and explanation of recharge sources for this basin:

   "Historically it was assumed that the LAS of the Pleasant Valley Basin was relatively confined and received little overall recharge. This assumption was based on the understanding that the primary recharge source for this basin was from the adjacent Oxnard Plain Basin to the south and recharge potential between these basins was low due to the low permeability of the Pleasant Valley Basin aquifer in this region, as well as the presence of a fault barrier in the lower portions of the Oxnard Plain. However, since the early 1990's, water levels have begun to rise in the northern adjacent basins. The City of Camarillo has two existing wells in the northeast portion of the Pleasant Valley Basin (hereafter called the Somis Area) and these wells confirm that rising water levels in northern adjacent basins directly impact recharge rates, water quality, and water levels in the Somis Area.

The recharge in the Somis Area (Pleasant Valley Forebay) may be a result of the Saugus Formation being folded upward and subsequently eroding away in the Somis gap area covering the underlying bedrock with a predominantly sandy alluvial layer that allows rapid stream flow percolation. If this theory is correct, it is also likely true that the primary source of recharge for the Pleasant Valley Basin prior to the decline of the water levels in the adjacent northern basins was a forebay in the Pleasant Valley Basin and this primary recharge source is again prevalent due to the recent rise in water levels in the northern basins. It is recommended that additional monitoring and studies be conducted to determine if this theory is correct."

Figure 1 illustrates the conceptual location of the Pleasant Valley Forebay.

4. Comment: Page 58 indicates the following, *"Base flow from the Arroyo Las Posas has migrated completely across the South and East Las Posas Basins and into the northernmost Pleasant Valley Basin, providing a source of <u>new</u> recharge to this portion of the Pleasant Valley Basin. Coordination in pumping strategies between the sub-basins is recommended in order to avoid negatively impacting groundwater levels in the Fox Canyon Groundwater Basin."* As stated in Comment #3, this may not be a "new" source of recharge but instead reestablishing of an old source of recharge to the Pleasant Valley Basin.

   Recommended Action: Consider revising the text to indicate that the Somis Gap was potentially the primary recharge source for the Pleasant Valley Basin prior to pumping activities in the northern adjacent basins.

5. Comment: The Draft GMP does not segregate the Pleasant Valley Basin into sub-basins, it only describes the basin as a whole. Furthermore, the last sentence of the second paragraph of page 17 indicates a lack of current understanding of this basin.

   Recommended Action: Please elaborate on the current understanding of the Pleasant Valley Basin and clarify how the basin is currently handled in the model. It is also recommended that the authors consider sub-dividing the Pleasant Valley Basin into sub-basins (Pleasant Valley Forebay and Pleasant Valley Basin) to assist in evaluating the different potential recharge sources for the basin.

6. Comment: The second paragraph on page 33 indicates groundwater levels in the LAS have consistently been below sea level in the Pleasant Valley Basin. This is not true across the entire basin.

   Recommended Action: Clarify that water levels in the southern portion of Pleasant Valley Basin have historically been below sea level since the 1950's. However, water levels in the northeastern portion of the basin near the Somis gap have historically been above sea level and continue to rise along with levels in the adjacent northern basins.

7. Comment: The last sentence of the second paragraph on page 29 states that: *"It is too early to know whether chlorides in the Pleasant Valley Basin will escalate to a problem affecting local pumpers."* This sentence is restated in the third sentence of the second paragraph on page 35. In both places it should be noted that two City of Camarillo wells (Wells A and B) have already been impacted by a rise in chlorides, which has prompted the City to discontinue use of Well A and to blend water from Well B with higher quality imported water to meet drinking water standards.

   Recommended Action: Revise the referenced sentences to indicate that chloride levels in the southern portion of the basin have risen marginally from rising water levels, but due to limited data, the marginal rise of chloride levels could be much higher. However, as shown on Figure 14 of the draft GMP, sulfate and TDS levels in the northern portion of the Pleasant Valley Basin have been rising steadily and have already exceeded secondary drinking water standards. Available data also indicate that concentrations of iron and manganese are also rising in response to basin recharge and have risen to levels that impair M&I uses.

8. Comment: Page 35 provides discussion on increasing sulfate and chloride levels in the northern Pleasant Valley Basin and indicates water treatment will be needed for potable or irrigation use.

   Recommended Action: Consider expanding the discussion to include the following text: *"Camarillo has evaluated the feasibility of constructing a Groundwater Treatment Facility that would intercept a portion of the poorer water quality surge and remove salts from the aquifer system. This would help protect the water quality in the southern portion of the basin and preserve higher quality water for use by other pumpers in areas of major overdraft. Furthermore, by utilizing the water from the Groundwater Treatment Facility, Camarillo could curtail or eliminate pumping operations in the southern portion of the Pleasant Valley Basin, which would promote recovery of the depressed water table in that region. Further details of the project are provided in the section titled, Development of Brackish Groundwater, Pleasant Valley Basin."*

9. Comment: The second sentence of the last paragraph on page 43 indicates, *"Basin Management Objectives (BMOs) for chloride concentrations in the Pleasant Valley Basin are currently being met, although chlorides are rising slowly in a few wells in the basin."*

   There are a number of wells that indicate that the BMOs are not being met. For example, County data indicate that 1N/21W-1B04 screened 820 to 1150 feet has chloride greater than 200 mg/l, 1N/21W-3C01 screened 956 to 1216 feet has chloride greater than 260 mg/l, and 1N/21W-1D02 screened 107 to 437 feet has chloride greater than 450 mg/l.

   Recommended Action: Consider revising the statement to indicate that BMOs are not currently being met throughout the entire Pleasant Valley Basin.

10. Comment: The first sentence of the last paragraph on page 58 indicates, *"Under current FCGMA policy, City of Camarillo pumping of poor-quality groundwater along Calleguas*

Creek would have to be pumped using existing allocations if the well was within the FCGMA boundary." The City of Camarillo understands that current FCGMA policy has evolved over time and has previously allowed unrestricted pumping of poorer quality shallow groundwater, with the semi-perched zone in the Oxnard Plain and the South Las Posas along the Arroyo being two examples.

Recommended Action: Consider revising the last paragraph of page 58 to say: *"Previously, City of Camarillo pumping of poor-quality groundwater along Calleguas Creek would have to be pumped using existing allocations since the wells are within the FCGMA boundary. However, as FCGMA policy has evolved over time, unrestricted pumping of poorer quality shallow groundwater has been allowed. For the Camarillo Project, a coordinated effort between the FCGMA and City of Camarillo should be undertaken to define the potential benefits of operating the City of Camarillo Groundwater Treatment Facility. Extractions of poor-quality water without allocations are discussed in more detail in the section titled "Recommended Additions to FCGMA Policies."*

Comments Regarding Further Pumping Reduction Strategies

The Draft GMP includes discussions on the continuation of 25 percent pumping reductions. The M&I users are impacted by reduction strategies while agricultural users are impacted by irrigation efficiency strategies. The actual benefit of the 25 percent pumping reduction is limited because the M&I component of groundwater use (about 30 percent) is significantly less than agricultural uses (about 70 percent) as illustrated in Figures 4 and 5 of the GMP. As a result, this strategy will only ensure a minor reduction in the overall pumping, which will be from the M&I users. This conserved amount could easily be negated by inefficient agricultural practices. Therefore, it is recommended that the 25 percent (or greater) reduction strategies should be reviewed in conjunction with agricultural efficiency calculations. In addition, FCGMA should consider more restrictive crop efficiencies and consider a replenishment fee to be paid by all users.

Specific comments related to pumping reduction strategies are:

11. Comment: The last 3 paragraphs on page 23 discuss groundwater extraction reduction. The numbers presented in the second paragraph in this section indicates that the total reduction in pumping is about 22 to 23 percent. The next paragraph indicates that the largest decrease in pumping is from agricultural uses, while the last paragraph indicates that the first phase of the FCGMA enforced pumping reductions of 15 percent resulted in the reduction of 8,300 acre-feet of pumping by the M&I users. However, the discussion on the reduced pumping does not appear to reflect the transfer of allocation from agricultural uses to M&I service, or the fact that while some M&I providers are using all their allocation, others have been conserving them for conjunctive use with other sources. We believe that the apparent 15 percent reduction in pumping is somewhat coincidental and that the overall M&I allocation for groundwater use has increased substantially due to land use conversion.

Recommended Action: This discussion should compare the changes in acreage irrigated and

M&I acreage served over the same time period that pumping reduction has occurred. This may also be the place to discuss the likelihood that under recording meters, or agricultural wells with no meters at all, may be contributing to the apparent reduction in reported agricultural pumping.

12. Comment: The second paragraph of page 52 implies that there is a universal acceptance of the pumping reductions and the stiff penalty for over pumping. The City of Camarillo doesn't agree that there is a universal acceptance of the pumping reductions. It is the City's view, as well as other M&I users, that the reduction is not equitable and recommends that the efficiency policy be reviewed in conjunction with production meter testing activities.

    Recommended Action: Consider revising the text to indicate there may be general acceptance of the pumping reduction policies but not universal agreement. The reduction policies should consider equal distribution in sharing the burden in resolving water level deficits in the basins..

General Comments on the Draft GMP

The following comments and recommendations are more general in nature:

13. The third paragraph on page 59 states that the baseline allocation is two acre-feet per acre. The City of Camarillo understands that the two acre-feet per acre may have been the historical allocation, not the baseline allocation. Baseline allocation is only one acre-foot of water per acre, and should be considered when analyzing the baseline allocation policies.

14. Page 63 provides a discussion on the potential effectiveness of importing additional state water. Further clarification of this paragraph would be very helpful in understanding this potential strategy.

15. Page 73 provides a discussion on penalties used to purchase replacement water. It should be noted that a large percentage of overpumping is by agricultural users who have the ability to escape penalties by switching to irrigation efficiency and consequently the revenue from these fees has historically been very little. Therefore, using this revenue to purchase replenishment water may be of little benefit to the basins.

16. Page 79 includes a section on *"Extractions of Poor-Quality Water Without An Allocation"*, which would be an addition to current FCGMA policy. The City of Camarillo supports such a strategy that allows projects that would benefit the overall aquifer system. The City of Camarillo would like to see this policy implemented and would appreciate the opportunity to review and comment on the draft policy.

17. FCGMA has reduced pumping and approved projects that provide some benefit to some portion of aquifers within the agency boundaries. However, this does not promote the implementation of projects in critical areas of the basin that are just outside of agency boundaries.

Before implementing the next stage of pumping reductions on M&I users, the City of Camarillo recommends that the FCGMA evaluate larger picture projects that could help solve groundwater impacts in the most critical areas and potentially provide solutions in-lieu of additional pumping reductions.

Further pumping reductions could possibly be avoided if the current basin by basin management approach was revised and strategies were implemented based on the principal that downstream basins are impacted by upstream uses and that the impact is therefore created by both agricultural and M&I users who pump from all basins.

FCGMA could consider implementing a "mitigation fee" of approximately $10/AF that would be paid by all groundwater users in the FCGMA. This strategy would allow funding for agencies like UWCD, Oxnard, or Calleguas MWD to develop projects that would effectively improve the conditions of the basins as a whole by moving water to over pumped areas within FCGMA boundaries. This approach would help prevent basin by basin management which could inordinately impact users in downstream basins, like the City of Camarillo.

18. The City of Camarillo is under the impression that there is a quantifiable amount of groundwater being exported outside the FCGMA boundary from Pleasant Valley and Las Posas Basins. The City of Camarillo would recommend that FCGMA pursue controlling the exportation of groundwater before additional pumping reductions are approved.

19. The Draft GMP indicates that FCGMA is considering expiring accumulated groundwater credits. It should be noted that M&I users conjunctively balance surface water and imported supplies with local groundwater thereby conserving groundwater for use when surface and imported supply is not available. Therefore, setting a time limit on credits works against this water supply management philosophy.

    Credit reduction is an issue that should be reviewed separately for M&I uses and agricultural uses. Similar to implementing 25 percent pumping reductions, credit reductions would only impact M&I agencies who conduct long-term planning, since agricultural users could go on efficiency allocation and would not be impacted by a loss of credits. M&I users do not have this option.

    In regards to agricultural credits, please note that UWCD surface water deliveries have in part allowed accumulation of credits by agricultural users that receive surface water for irrigation. Those who funded the Freeman Diversion have in part funded the accumulation of these credits when surface deliveries were annually increased.

    The credit reduction strategy is believed to be of very little benefit to the overall basins but would have a significant impact to M&I users. If there is a desire to eliminate the perceived "groundwater debt", agricultural credit reduction should be the first consideration.

Pages 71 and 72 state that there are tens of thousands of acre-feet of accrued conservation credits. The credits that the City of Camarillo has accrued came at a high cost, when we purchase more expensive imported water. Poor quality groundwater has forced the City of Camarillo to blend groundwater with imported supplies, subsequently accruing groundwater credits. The City of Camarillo intends to retain its credits until such time they are needed to meet demands during a drought. Even though credits cannot be sold, they have a value to M&I users that is equal to the over pumping surcharge.

FCGMA should reconsider the proposed strategy of expiring/reducing M&I groundwater credits .

20. Page 73 discusses proper filling and capping of abandoned or leaking wells and states that FCGMA helps with the costs associated with well abandonment. The owner of the land that the well is on should be responsible for costs associated with destruction of well(s).

21. Page 75 provides a discussion of additional reductions in pumping allocations. It is recommended that further reductions not be implemented until after the meter testing effort is complete. Perhaps FCGMA should require an initial testing of all meters within one year. This would be very beneficial to the modeling effort because the model will only be as accurate as the information used to develop it.

The City of Camarillo requests the opportunity to provide additional comments once the groundwater modeling effort for the GMP is available for review. The City believes it would be valuable if the GMP provided more quantifiable measures regarding water level deficits and anticipated impacts each FCGMA strategy would contribute towards reducing those deficits. However, the City recognizes that those quantifiable measures would much easier to identify once the modeling results are available.

Please contact me at (805) 388-5334 if you have any questions or need additional information.

Very truly yours,

City of Camarillo

Lucia McGovern
Deputy Director of Public Works

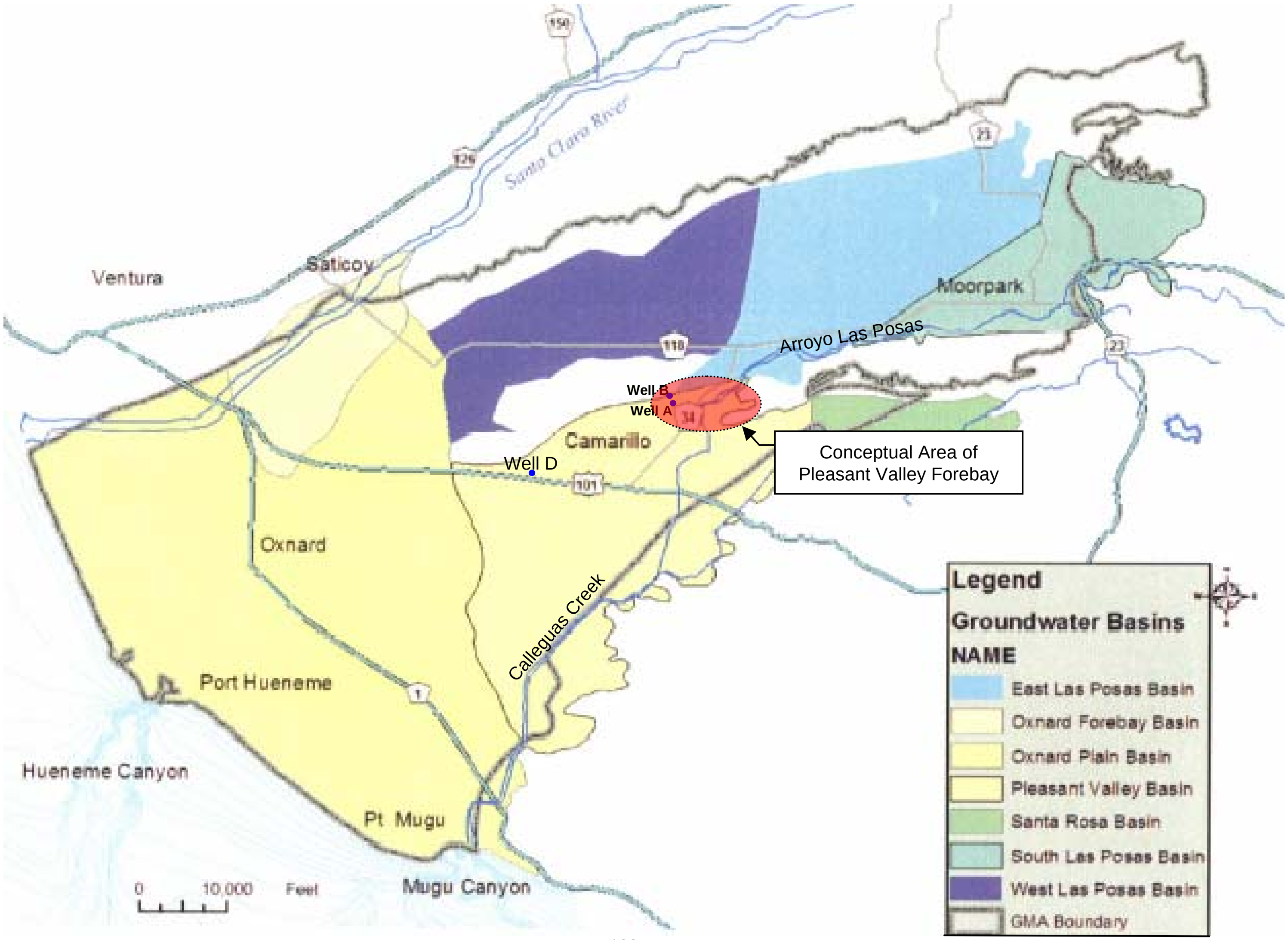
Attachment – Figure of Pleasant Valley Forebay

City of Camarillo Comments on June 2006 Draft GMP
August 25, 2006

cc:
Tom Smith – City of Camarillo
Curtis Hopkins – Hopkins Consultants
Randy Krueger – Black & Veatch
Tony Emmert – City of Oxnard
Jim Kentosh – UCWD
Jim Passanisi – City of Ventura
Carrie Mattingly – City of Port Hueneme
Steve Bachman, PhD – UCWD
Don Kendall, PhD – Calleguas MWD

Figure 1

Pleasant Valley Forebay Map



Lawrence (Larry) Fuller
7935 Dusty Lane
Somis, CA 93066
805-386 -4086

September 26, 2006

Fox Canyon Groundwater Management Agency
800 S. Victoria Ave.
Ventura, CA 93009

Attn: David Panaro, Jeff Pratt & Steve Bachman

Subj: Comments and concerns on the FCGWMA Management Plan.

Hi David,

I told you that I would put in writing some of my thoughts and concerns expressed in the 1st workshop. My research has led me to look at the management plan in the light of the State of California water case law especially the case CITY OF BARSTOW et al., v. MOJAVE WATER AGENCY (S071728) 21 August 2000. This case clarifies the Supreme Court of California's position on water rights. A summery of the Courts decisions can be found in Downey Brand Attorneys LLP document titled California Water Law & Policy Reporter- October 2000.

It is my understanding that the FCGWMA used the "equitable" (physical) concept for allocating pumping to all of the Fox Canyon aquifer pumpers. This method of allocation is clearly a violation of the law, if I understand the California Supreme Court ruling cited above. The three levels of priority, as stated in the case law, are 1st Priority Overlying Owners, 2nd in priority are appropriators and 3rd are exporters (water transferred out of the immediate pumping area).

The clearest statement of this fact is found on page 29 starting with line 3. "We repeat the guiding principle: 'Under California law, "[p]roper **overlying use**,...is paramount, and the right of an **appropriator**, being limited to the amount of **surplus**, must yield to that of the overlying owner in the event of a shortage unless the appropriator has gained prescriptive rights through the taking of nonsurplus waters." [Citation.]' (*Hi-Desert County Water Dist. V. Blue Skies Country Club, Inc., supra*, 23 Cal.App.4th 1723-1731. Thus, while the rights of all overlying owners in a ground water basin are correlative, and subject to cutbacks when the basin is over drafted, **overlying rights are superior to appropriative rights.** Here, the trial court did not attempt to determine the priority of water rights, and merely allocated pumping rights based on prior production. This approach elevates the rights of appropriators and those producing without any claim of right to the same status as the rights of riparins and overlying owners. The trial court erred in doing so."

It is my request that the FCGWMA board of directors DO NOT make any further pumping reductions until these legal issues can be resolved. The case law sited states that only the Court has the right to restrict our pumping. A little caution now could prevent law suits caused by not following the law. (page 54,61) The original allocation system did not take into consideration efficient use of water and therefore it was/is flawed. The allocation should also consider the number of water sources available to a given property. Some properties have water available via pipelines from major water suppliers while many properties are dependent on their wells as the only source of water. Small users, Coops and small M &I/Agriculture systems are not addressed specifically in Management Plan. In addition to this the FCGWMA board has no small operation representative on the board to insure that their interests and concerns will be heard.

Another issue that I talked about in the workshop was the FCGWMA's Board approval of CMWD application for injection/storage facilities in North Las Posas Groundwater Basin.

According to my understanding this letter opens the door for CMWD to acquire Fox Canyon Aquifer **prescriptive** pumping rights. The Board has already allowed the injection wells to be drilled and injection of imported water is progressing. It is imperative that CMWD be restricted **IN WRITING** that they will not be allowed to extract water outside of their injection field. The Board can not by letter change the California water laws regarding prescriptive water rights that can and will be developed if pumping is allowed outside of the injection site boundaries. See page two paragraph 4. end of 1st sentence....**OR IN THE NEAR VICINITY**. What constitutes "near"? One mile, five miles? It is a known fact that CMWD wants to pump Fox Canyon water to blend with their imported water. Overlying owner priority rights will be affected if this issue is not addressed before any extraction is started out side their injection field.

Another problem area with CMWD that was discussed, concerned the One for One or gallon for gallon of water pumped to be extracted. When I addressed this issue your engineer made light of my comments concerning both the wetting factor of the dry sands and the drift factor of the water moving through the aquifer. I have friends that are very knowledgeable in the field of both hydrology and geology. They state that anyone who knows anything about the Fox Canyon aquifer knows about the drift out through Hueneme Canyon and the losses of fluid due to wetting of a dry formation. I can only assume that CMWD is injecting into an area that is dry—water does not compress. David this is right down your alley. I know with your training you can do the calculations for both the wetting and the transfer function even if your engineer can't. The FCGWMA should not be providing free water to CMWD.

The Court case sited discussed in detail the effect of allowing a right by prescription to be developed. Please look into all of the FCGWM ordinances in the light of the rulings by the Court.

Sincerely,

Larry Fuller

Larry Fuller

Encl: Copies for Mr. Jeff Pratt
Mr. Steve Bachman

Fox Canyon Groundwater Management Agency
Ordinance Code

Adopted July 27, 2005
Amended July 28, 2010

CHAPTER 1.0
Definitions

As used in this code, the following terms shall have the meanings stated below:

1.1. **"Actual Applied Water"** – means the total water applied by the grower to the crop over the course of a calendar year without regard to the water source. Examples of actual applied water include the sum of well water, water delivered from a water supplier, and or from surface water diversions. Total applied water does not include precipitation.

1.2. **"Agency"** means the Fox Canyon Groundwater Management Agency.

1.3. **"Agency Boundary"** shall be as depicted on the map adopted by the Board and recorded as an official record with the County Recorder's Office on January 14, 2002 (Document No. 2002-0009215), and as may be adjusted as provided in the Agency's enabling legislation.

1.4. **"Agricultural Extraction Facility"** means a facility from which the groundwater produced is used on lands in the production of plant crops or livestock for market, and uses incidental thereto.

1.5. **"Annual"** means the calendar year January 1 through December 31.

1.6. **"Aquifer"** means a geologic formation or structure that yields water in sufficient quantities to supply pumping wells or springs. A confined aquifer is an aquifer with an overlying less permeable or impermeable layer.

1.7. **"Board"** means the Board of Directors of the Fox Canyon Groundwater Management Agency.

1.8. **"County"** means the County of Ventura.

1.9. **"Developed Acreage"** means that portion of a parcel within the Agency Boundary that is receiving water for reasonable and beneficial agricultural, domestic or municipal and industrial (M & I) use.

1.10. **"East Las Posas Basin"** That part of the former North Las Posas Basin that is east of the subsurface anomaly described by significant changes in groundwater levels, as described in the Groundwater Management Plan and located for record purposes on maps as provided in Section 1.20.

1.11. **"Excess Extraction"** means those extractions in excess of an operator's extraction allocation or adjusted extraction allocation.

1.12. **“Executive Officer”** means the individual appointed by the Board to administer Agency functions, or his/her designee.

1.13. **“Exempt Well Operators”** means all well operators operating extraction facilities supplying a single family dwelling on one acre or less, with no income producing operations and those operators granted an exemption by the Board.

1.14. **“Expansion Area”** means that portion of land beyond the outer limits of the Agency Boundary in the West, East, and South Las Posas Basins that lies between the Agency Boundary and the crest of the hill or 1.5 miles beyond the Agency Boundary as defined by Map Number Two, entitled Fox Canyon Outcrop, Las Posas Basin, 1995. .

1.15. **“Extraction”** means the act of obtaining groundwater by pumping or other controlled means.

1.16. **“Extraction Allocation”** means the amount of groundwater that may be obtained from an extraction facility during a given calendar year, before a surcharge is imposed.

1.17. **“Extraction Facility”** means any device or method (e.g. water well) for extraction of groundwater within a groundwater basin or aquifer.

1.18. **“Foreign Water”** means water imported to the County through the State Water Project facilities or other newly available water as approved by the Board, such as recycled water that would otherwise be lost to the Ocean.

1.19. **“Groundwater”** means water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water.

1.20. **“Groundwater Basin”** means a geologically and hydrologically defined area containing one or more aquifers, which store and transmit water yielding significant quantities of water to wells. For the purposes of this Ordinance Code, groundwater basins that of which either all or a portion or portions thereof are located within the Agency Boundary include, but are not limited to the Oxnard Plain Forebay Basin, Oxnard Plain Pressure Basin, Pleasant Valley Basin, East Las Posas Basin, West Las Posas Basin, South Las Posas Basin and the Arroyo Santa Rosa Basin, as described in the Groundwater Management Plan. The boundaries of these basins are shown on maps that shall be adopted by a Resolution. Groundwater basin boundaries may be modified by a Resolution.

1.21. **“Groundwater Management Plan”** means the 2007 Update to the Fox Canyon Groundwater Management Plan or Board-adopted updates to this plan.

1.22. **“Historical Extraction”** means the average annual groundwater extraction based on the five (5) calendar years of reported extractions from 1985 through 1989 within the Agency Boundary. This average will be expressed in acre-feet per year. All historical extraction allocations became effective on January 1, 1991.

1.23. **“Inactive Well”** An inactive well is a well that conforms to the County Water Well Ordinance requirements for an active well, but is being held in an idle status in case of future need. Idle status means the well is pumped no more than 8 hours during any 12-month period. Inactive wells are not required to have a flowmeter. Pumping to maintain status as an active well under the County Water Well Ordinance shall not exceed 8 hours in a 12 month period, shall be for beneficial use, and shall be estimated and reported to the Agency. Prior to removing a well from idle status, the operator shall install a flowmeter in accordance with the requirements in Chapter 3 of the Ordinance Code.

1.24. **“Injection/Storage Program”** means any device or method for injection/storage of water into a groundwater basin or aquifer within the Agency Boundary, including a program to supply foreign water in lieu of pumping.

1.25. **“Las Posas Outcrop”** or **“Outcrop”** means the area of Lower Aquifer System surface exposure as defined by Map Number One, Fox Canyon Outcrop, Las Posas Basin, 1982.

1.26. **“May”** as used in this Ordinance Code, permits action but does not require it.

1.27. **“Flowmeter”** means a manufactured instrument for accurately measuring and recording the flow of water in a pipeline.

1.28. **“Municipal and Industrial (M & I) Provider”** means person who provides water for domestic, industrial, commercial, or fire protection purposes within the Agency Boundary.

1.29. **“Municipal and Industrial (M & I) Operator”** An owner or operator that supplied groundwater for M & I use during the historical allocation period and did not supply a significant amount of agricultural irrigation during the historical period.”

1.30. **“Municipal and Industrial (M & I) User”** means a person or other entity that used or uses water for any purpose other than agricultural irrigation.

1.31. **“Municipal and Industrial (M & I) Use”** means any use other than agricultural irrigation.

1.32. **“Non-Operating Flowmeter”** – A non-operating flowmeter includes a flowmeter that is out of calibration by plus or minus 5%, and/or a flowmeter that has not been calibrated within the flowmeter calibration schedule adopted by the Board.

1.33. **“Operator”** means a person who operates a groundwater extraction facility. In the event the Agency is unable to determine who operates a particular extraction facility, then “operator” shall mean the person to whom the extraction facility is assessed by the County Assessor, or, if not separately assessed, the person who owns the land upon which the extraction facility is located.

1.34. **“Ordinance Code”** means the Fox Canyon Groundwater Management Agency Ordinance Code.

1.35. **“Overdraft”** means the condition of a groundwater basin or aquifer where the average annual amount of water extracted exceeds the average annual supply of water to a basin or aquifer.

1.36. **“Owner”** means a person who owns a groundwater extraction facility. Ownership shall be determined by reference to whom the extraction facility is assessed by the County Assessor, or if not separately assessed, the person who owns the land upon which the extraction facility is located.

1.37. **“Perched”** or **“Semi-Perched Aquifer”** means the shallow, unconfined aquifer that overlies the Oxnard Aquifer in Sealing Zone III, as described in the California Department of Water Resources Bulletin No. 74-9.

1.38. **“Person”** includes any state or local governmental agency, private corporation, firm, partnership, individual, group of individuals, or, to the extent authorized by law, any federal agency.

1.39. **“Recharge”** means natural or artificial replenishment of groundwater in storage by percolation or injection of one or more sources of water.

1.40. **“Resolution”** means a formal statement of a decision adopted by the Board.

1.41. **“Safe Yield”** means the condition of groundwater basin when the total average annual groundwater extractions are equal to or less than total average annual groundwater recharge, either naturally or artificially.

1.42. **“Section”** as used in this Ordinance Code, is a numbered paragraph of a chapter.

1.43. **“Semi-Annual Groundwater Extraction Statement”** is a form filed by each operator containing the information required by Section 2.2 and 2.3.1 and shall cover the periods from January 1 to June 30 and from July 1 to December 31 annually.

1.44. **“Shall”** as used in this Ordinance Code, is an imperative requirement.

1.45. **“Well Flushing”** means the act of temporarily discharging extracted groundwater through a connection located upstream of the water distribution system at the beginning of an extraction cycle. Well flushing is typically performed until the quality of the extracted water is suitable for beneficial use and/or will not damage the distribution system. In some cases, the flushing flows may be discharged upstream of the distribution system, including the flowmeter. Flushing flows discharged upstream of the flowmeter shall be estimated and reported to the Agency in accordance with the requirements accordance with the requirements in Chapter 2 of the Ordinance Code.

1.46. **“Well Rehabilitation”** means the act of restoring a well to its most efficient condition by various treatments, development, or reconstruction methods. In most cases, groundwater extracted during well rehabilitation is not discharged through the extraction facility piping and, consequently, is not flowmetered. In these cases, the volume of water extracted shall be estimated and reported to the Agency in accordance with the requirements accordance in Chapter 2 of the Ordinance Code.

1.47. **“West Las Posas Basin”** is that part of the former North Las Posas Basin that is west of the subsurface anomaly described by significant changes in groundwater levels, as described in the Groundwater Management Plan and located for record purposes on maps as provided in Section 1.20.

CHAPTER 2.0
Registration of Wells and Levying of Charges

2.1. Registration of Wells

2.1.1. Agency Water Well Permit Requirement (No-Fee Permit) – All new extraction facilities constructed within the Agency Boundary shall obtain a no-fee permit from the Agency prior to the issuance of a well permit by the County.

2.1.2. Registration Requirement – All groundwater extraction facilities within the boundaries of the Agency shall be registered with the Agency within 30 days of the completion of drilling activities or within 30 days after notice is given to the operator of such facility. No extraction facility may be operated or otherwise utilized so as to extract groundwater within the Agency Boundary unless that facility is registered with the Agency, flowmetered and permitted, if required, and all extractions reported to the Agency as required. The operator of an extraction facility shall register his extraction facility and provide in full, the information required to complete the form provided by the Agency that includes the following:

2.1.2.1. Name and address of the operator(s).

2.1.2.2. Name and address of the owner(s) of the land upon which the extraction facility is located.

2.1.2.3. A description of the equipment associated with the extraction facility.

2.1.2.4. Location, parcel number and state well number of the water extraction facility.

2.2. **Change in Owner or Operator** - The name of the owner of each extraction facility, the parcel number on which the well is located along with the names of all operators for each extraction facility shall be reported to the Agency within 30 days upon any change of ownership or operators, together with such other information required by the Executive Officer.

2.3. **Reporting Extractions** - All extractions shall be reported to the Agency. All extractions shall be flowmetered in accordance with the requirements and methods for flowmetering extractions as specified by Chapter 3. In cases where flowmetering is not required, the volume of water extracted shall be estimated and reported to Agency. The Agency shall send a “Semi-Annual Groundwater Extraction Statement” form to each well operator on or about the first week of January and the first week of July each year. Each operator of a registered extraction facility shall enter the necessary information and return the “Semi-Annual Groundwater Extraction Statement” covering all wells they operate on or before the due date. Statements are due on or before February 1st or August 1st annually or thirty days after the date of the letter requesting submittal of the Semi-Annual Statement for the given period. Statements shall contain the following information on forms provided by the Agency:

2.3.1. The information required under Section 2.1.2 above.

2.3.2. The method of measuring or computing groundwater extractions.

2.3.3. The crop types or other uses and the acreage served by the extraction facility.

2.3.4. Total extractions from each extraction facility in acre-feet for the proceeding six (6) month period.

2.4. **Groundwater Extraction Charges**

2.4.1. All persons operating groundwater extraction facilities shall pay a groundwater extraction charge for all groundwater extracted after July 1, 1993, in the amount as established by Resolution. Payments are due semi-annually, and shall accompany the statement required pursuant to Section 2.3.

2.4.2. Payments are due forty-five (45) days after the billing date, and payments not received or postmarked by such date due shall be charged interest from and after such date due until payment thereof at the rate of 1.5 percent per month, or part of month that the charge remains unpaid. Late Penalty. The operator shall pay a late penalty for any extraction charge not satisfied by the due and payable date. The late penalty shall be 1½ percent per month, or any portion thereof, of the amount of the unsatisfied extraction charge. The late penalty shall not exceed 100% of the original charge, provided the penalty is paid within 60 days of the due date. If the fee is not paid within the 60 days, the penalty will continue to accrue at 1.5 percent per month with a final maximum of 200% of the original penalty due.

2.4.3. Owners of extraction facilities are ultimately responsible for payment of pumping charges and penalties should an operator not pay. Consequently, owners are charged with providing for this liability in agreements entered into with well operators and water users.

2.5. **Collection of Delinquent Extraction Charges and Late Penalties** - The Board may order that any given extraction charge and/or late penalty shall be a personal obligation of the operator or shall be an assessment against the property on which the extraction facility is located. Such assessment constitutes a lien upon the property, which lien attaches upon recordation in the office of the County Recorder. The assessment may be collected at the same time and in the same manner as ordinary ad valorem taxes are collected, and shall be subject to the same penalties and the same procedure and sale, in case of delinquency as provided for such taxes. All laws applicable to the levy, collection and enforcement of ad valorem taxes shall be applicable to such assessment, except that if any real property to which such lien would attach has been transferred or conveyed to a bona fide purchaser for value, or if a lien of a bona fide encumbrance for value has been created and attaches thereon, prior to the date on which the first installment of such taxes would become delinquent, then the lien which would otherwise be imposed by this section shall not attach to such real property and an assessment relating to such property shall be transferred to the unsecured roll for collection.

2.6. **Use of Extraction Charges and Late Penalties** - Revenues generated from extraction charges and late penalties shall be used exclusively for authorized Agency purposes, including financial assistance to support Board approved water supply, conservation, monitoring programs and water reclamation projects that demonstrate significant reductions in overdraft.

CHAPTER 3.0
Installation and Use of Flowmeters for Groundwater Extraction Facilities

3.1. Installation and Use of Flowmeters

3.1.1. Installation Requirement - Prior to extracting groundwater, the operator shall install a flowmeter. With the exception of connections used for well flushing and extraction facilities used by multiple operators, flowmeters shall be installed upstream of all connections to the main discharge line. Flowmetering is not required during well flushing and well rehabilitation; however, the volume of water extracted shall be estimated and reported to the Agency. Flowmeters are not required on inactive wells as defined in this Ordinance Code, nor are flowmeters required for extraction facilities supplying a single family dwelling on one acre or less, with no income producing operations. If more than one operator uses the same extraction facility, flowmeters shall be installed to record the water use of each operator. Well operators were required to install flowmeters on wells by July 1, 1994.

3.1.2. Flowmeter Failure and Back-up Measurement Requirements - Flowmeters occasionally fail, losing periods of record before the disabled or inaccurate meter is either replaced or repaired. When a flowmeter fails, the operator shall repair or replace the flowmeter within the timeframe specified in a separate Resolution. Flowmeter failures and associated repairs or replacements shall be reported to the Agency together with any other information required by the Executive Officer on or before the due date of the next Semi-Annual Groundwater Extraction Statement. Well operators shall be prepared to provide another acceptable method of computing extractions during these periods of flowmeter failure to avoid the loss of record on wells that require flowmetering under this Ordinance Code.

3.1.3. Back-up Methods - It is the operator's responsibility to maintain the flowmeter. Any allowable or acceptable backup measurement methods will be specified in a separate Resolution and may be changed as technology improves or changes.

3.1.4. Flowmeter Readings - Functional flowmeters shall be read and the readings reported semi-annually on the extraction statements required under Section 2.3 above.

3.1.5. Inspection of Flowmeters - The Agency may inspect flowmeter installations for compliance with this Ordinance Code at any reasonable time.

3.2. **Flowmeter Testing and Calibration** - All flowmeters shall be tested for accuracy at a frequency interval determined by the Board to meet specific measurement standards. Calibration methods and procedures approved by the Board shall be detailed in an adopted Resolution.

3.3. **Altering Flowmeters** - Any person who alters, removes, resets, adjusts, manipulates, obstructs, or in any manner interferes or tampers with any flowmeter affixed to any groundwater extraction facility required by this Ordinance Code, resulting in said flowmeter to improperly or inaccurately measure and record groundwater extractions, is guilty of an intentional violation of this Ordinance Code and will be subject to any and all penalties as described in Chapter 8.

3.4. **Costs of Testing and Calibration** - All costs incurred with flowmeter testing or calibration shall be the personal obligation of the well owner. Non-compliance with any provision of the flowmeter calibration requirements will subject the owner to financial penalties and/or liens as described below or in Chapter 8 of the Ordinance Code.

3.5. **Fees and Enforcement** - If any water production facility within the Agency's boundaries is used to produce water without a flowmeter or with a non-operating flowmeter in excess of the allowable timeframe specified in a separate Resolution, the Agency shall assess a Non-Metered Water Use Fee against the water production facility owner. The amount of the fee shall be calculated as follows:

3.5.1 Groundwater extraction facilities - The fee shall be equal to double the current groundwater extraction charge for all estimated water used. Estimates of water used shall be calculated by the operator and approved by the Executive Officer. Any delinquent extraction charge obligations shall also be charged interest at the rate of 1.5 percent per month on any unpaid balances.

3.6. Upon violation of any flowmeter provision, the Agency may, as allowed by law, petition the Superior Court of the County for a temporary restraining order or preliminary or permanent injunction prohibiting the well owner from operating the facility or for such other injunctive relief as may be appropriate.

CHAPTER 4.0
Protection of the Las Posas Basins

4.1. **This chapter has the following purpose and intent:**

4.1.1. To eliminate overdraft from the aquifer systems within the boundary of the East and West Las Posas basins and bring these basins to a “safe yield” condition by the year 2010.

4.1.2. To protect the Las Posas outcrop as a source of groundwater recharge into the East and West Las Posas basins.

4.1.3. To prevent groundwater quality degradation of the East and West Las Posas basins by influence from the Expansion area.

4.1.4. This Ordinance Code is only one means by which these goals will be met.

4.2. **Anti-degradation and Extraction Prohibition**

4.2.1. Extraction Facility Permits.

4.2.1.1. Permit Required - Prior to: (a) initiating any new or increased use of groundwater in the Expansion area, obtained from any source within the Agency including the Expansion area; or (b) constructing a new or replacement extraction facility in the East or West Las Posas basins, or the Expansion area, a permit must be obtained from the Agency as provided in this Chapter. For the purpose of this Chapter, a new or increased use is that which did not exist or occur before June 30, 1988.

4.2.1.2. Permit Application - Application shall be made to the Agency on the approved County Water Well Ordinance form available from the County Public Works Agency and shall include all information required by the County Well Ordinance and the following:

4.2.1.2.1. Location of each water well to be used, along with the associated state well number.

4.2.1.2.2. Location(s) of groundwater use, including acreage accurately plotted on copy of the County Assessor's Parcel Map.

4.2.1.2.3. The proposed crop type(s) or Municipal and Industrial use(s) at each location.

4.2.1.2.4. A brief description of the type of irrigation or distribution system and flowmeter to be used.

4.2.1.2.5. The estimated average annual quantity of water use proposed for each location of use.

4.2.1.2.6. An identification of the source of historical allocation to supply the proposed water use by the well.

4.2.1.2.7. An analysis of the potential impacts on the water balance in the Las Posas Basins resulting from the proposed use(s).

4.2.1.3. Findings - A permit may only be granted if the Executive Officer finds that the proposed groundwater use will result in no net detriment to the East or West Las Posas Basins by determining that:

4.2.1.3.1. The Las Posas outcrop is not exposed to potential degradation of water quality of any type, and

4.2.1.3.2. Recharge to the East and West Las Posas Basins from the Las Posas outcrop is not diminished, and

4.2.1.3.3. Neither baseline nor efficiency allocation will be used, directly or indirectly, to support groundwater use on the Expansion Area, and (an example of indirect use is using efficiency to supply a demand inside the Agency and using the replaced historical allocation on the outcrop)

4.2.1.3.4. No increased or new uses of groundwater from inside the Agency Boundary will be applied on any area outside the Expansion area (or outside the East or West Las Posas boundary).

4.2.1.4. Permit Conditions. The Executive Officer may include in the permit granted, any conditions consistent with the purpose of this Chapter, including:

4.2.1.4.1. Any proposed agricultural use shall include the installation of irrigation systems that employ irrigation best management practices consistent with then current industry standards.

4.2.1.4.2. Any proposed municipal or industrial use shall include the installation of systems that employ municipal and industrial best management practices consistent with the then current industry standards.

4.2.1.4.3. A permit term, not to exceed 10 years from the date of issuance.

4.2.1.4.4. Mitigation, monitoring, and periodic reporting, as may be appropriate given the proposed use.

4.2.2. Permit Renewal - Permits may be renewed pursuant to the requirements of Section 4.2.1.

4.3. **Registration of Existing Uses** - The owners of groundwater wells located within the East or West Las Posas basins shall register their wells with the Agency no later than January 1, 2006, through the following procedure:

4.3.1. Registration Form - The Agency shall make available a registration form which shall be completed, and filed with the Agency for each well, which shall include the following:

4.3.1.1. Location(s) of all water well(s), along with the associated state well number(s) including offsite well(s) serving the proposed use. Information concerning wells shall also include any other use for the water well.

4.3.1.2. Location(s) of groundwater use for the well including acreage accurately plotted on a copy of the County Assessor's Parcel Map.

4.3.1.3. The proposed crop type(s) or Municipal and Industrial use(s) at each location.

4.3.1.4. A brief description of the type of irrigation or distribution system and flowmeter in use.

4.3.1.5. The estimated average annual quantity of water use at each location and for each well.

4.4. **Monitoring** - The Agency shall monitor compliance with this Chapter by reviewing County well permit applications and reported groundwater extractions and by conducting field surveys as may be necessary.

4.5 **Unreasonable Uses** - The Agency may commence and prosecute legal actions to enjoin unreasonable uses or methods of use of water within or without the Agency Boundary to the extent those uses or methods of use adversely affect the groundwater supply within the Agency Boundary.

CHAPTER 5.0
Reduction of Groundwater Extractions

5.1. **Purpose** - The purpose of this Chapter is to eliminate overdraft from the aquifer systems within the boundaries of the Agency and bring the groundwater basins to safe yield by the year 2010. It is not the purpose of this Chapter to determine or allocate water right entitlements, including those, which may be asserted pursuant to California Water Code sections 1005.1, 1005.2 or 1005.4.

5.2. **Extraction Allocations**

5.2.1. General Limitations

5.2.1.1. The Executive Officer shall establish an operator's extraction allocation for each extraction facility located within the Agency Boundary. The extraction allocation shall be the historical extraction as reported to the United Water Conservation District and/or to the Agency pursuant to Chapter 2 (or its successor), reduced as provided by Section 5.4, or as otherwise provided for in Section 5.6 of this Ordinance Code. An alternative allocation, either baseline or efficiency, may also be approved as explained in Sections 5.6.1.1 and 5.6.1.2. All extraction facilities have an allocation of zero unless the Executive Officer determines otherwise. The operator may determine whether the annual allocation used shall be either a combination of baseline and historical allocation, or based on an efficiency allocation. All wells used by an operator in any given basin shall be operated on either a combination of historical and baseline or an efficiency allocation except water purveyors as approved by the Executive Officer. As explained by Section 5.6.1.2, an efficiency allocation may not be combined with either a baseline or a historical allocation. Extraction allocations may be adjusted or transferred only as provided in Section 5.3.

5.2.1.2. Regardless of allocation, the total water use for agricultural purposes must be at least 60 percent efficient as determined by the formula described in Section 5.6.1.2.4. This 60 percent irrigation efficiency is totally unrelated to the 80 percent efficiency described in Section 5.6.1.2, “Annual Efficiency Extraction Allocation”.

5.2.1.3. Where an operator operates more than one extraction facility in the same basin, the extraction allocations for the individual facilities may be combined.

5.2.1.4. Where there is more than one operator for any agricultural extraction facility, each operator shall be entitled to a pro rata share of the facility's historical allocation based on either usage or acreage irrigated during the historical extraction period. Such pro rata shares shall be determined by the owner of the extraction facility, and this determination shall be subject to the approval of the Executive Officer.

5.2.1.5. When an operator is no longer entitled to use an extraction facility, that operator is no longer entitled to any portion of the extraction allocation attributed to that extraction facility.

5.2.1.6. A historical allocation is assigned to an extraction facility and a baseline allocation is assigned to the land, both may be used, but neither is owned by the operator.

5.2.1.7. Where there is a sale or transfer of a part of the acreage served by any extraction facility, the extraction allocation for that facility shall be equitably apportioned between the real property retained and the real property transferred by the owner of the extraction facility, This apportionment shall be approved by the Executive Officer who may modify the apportionment to assure equity.

5.2.1.8. The name of the owner of each extraction facility, the parcel number on which the well is located along with the names of all operators for each extraction facility shall be reported to the Agency with each semi-annual statement and within 30 days of any change of ownership or operators, together with such other information required by the Executive Officer.

5.2.1.9. The Executive Officer may, on written request from a land owner or well operator, waive allocation requirements for the extraction of groundwater from the Perched or Semi-perched aquifer of Sealing Zone III when the pumping of that groundwater is specifically for the purpose of lowering the water table to reduce the high water table threat to property, including the root zone of crops, or for dewatering construction sites. The Executive Officer shall require that the groundwater extraction facility used for this purpose be perforated only in the Perched or Semi-perched zone, and shall also require the landowner and/or the operator to protect the Agency from damage potentially caused by transferring water to another location.

5.2.2. General Limitations: Special Board Approval Requirements - Notwithstanding any other provisions of this Ordinance Code, the following uses of water resources associated with the aquifers within the Agency may only be undertaken with prior Board approval of and subject to the conditions and restrictions established by the Board.

5.2.2.1. Direct or indirect export of groundwater extracted from within the Agency Boundary for use outside the Agency Boundary.

5.2.2.2. The direct or indirect use of surface water or Foreign Water from within the Agency outside the Agency in a manner that may adversely affect the groundwater supply within the Agency.

5.2.2.3. Application to the Board - To obtain the approval of the Board for any use provided in Sections 5.2.2.1 and 5.2.2.2, application shall be made to the Agency describing the details of the proposed use, including all the following information:

5.2.2.3.1. The location of each water well to be used, along with the associated state well number, and/or the location of each surface diversion and a description of the associated water right.

5.2.2.3.2. Location(s) of groundwater use, including acreage, accurately plotted on copy of the County Assessor's Parcel Map.

5.2.2.3.3. The proposed crop type(s) or Municipal and Industrial use(s) at each location.

5.2.2.3.4. A brief description of the type of irrigation or distribution system and flowmeter to be used.

5.2.2.3.5. The estimated average annual quantity of water use proposed for each location of use.

5.2.2.3.6. An identification of the source of historical allocation, if any, to supply the proposed water use by the well.

5.2.2.3.7. An analysis of the potential impacts on the water balance in any Basin or Subbasin within the Agency Boundaries resulting from the proposed use(s).

5.2.2.4. Findings - The Board may approve the proposed use if, after a public hearing, it finds that the proposed use will result in no net detriment to the Basin, or any subbasin, or aquifer associated with the use, by determining that:

5.2.2.4.1. The proposed use does not result in the material degradation of water quality of any type, or

5.2.2.4.2. Recharge to any aquifer within the Agency is not materially diminished.

5.2.2.4.3. In granting approval to projects subject to this subsection, the Board may impose any conditions as may be appropriate, including limitations on the quantity of water use, term of the approval, and periodic reporting to the Agency.

5.2.3. An operator shall comply with all provisions of this Ordinance Code and Resolutions prior to receiving an extraction allocation.

5.3. Adjustments to Extraction Allocations

5.3.1. Adjustments to extraction allocations may be necessary to provide some flexibility, while still maintaining the goal of reaching a safe yield condition by the year 2010. Adjustments may be accomplished by a transfer, an assignment of historical extraction allocation, or a demonstration of a new water source.

5.3.2. Subject to the provisions in this Section 5.3, transfers of extraction allocation are authorized provided they result in no net detriment to the Basins within the Agency. In making this determination, consideration shall be given to the location of extraction facilities, the aquifer systems being used, potential groundwater quality impacts, and the overall assessment of the cumulative impacts of transfers of extraction allocation.

5.3.3. Types of Transfers of Allocation. When irrigated agricultural land(s) changes to M & I use, a basic extraction allocation of 2 acre-feet per acre shall be transferred. In addition, a historical extraction allocation shall be transferred from the agricultural extraction facility(s) operators to the M & I provider in accordance with the following conditions:

5.3.3.1. When the extraction facility is located on the land transitioning and did not serve other land during the historical allocation determination period, the M & I Operator shall receive a historical extraction allocation of 2 acre-feet per acre per year for the acreage transitioning to M & I use. Any historical allocation in excess of 2 acre-feet per acre for the land transitioning to M & I use shall be eliminated.

5.3.3.2. When the extraction facility is located on the land transitioning and served other land during the historical allocation determination period, the historical allocation associated with the transitioning property shall be allocated on a pro rata basis by acreage to the total property served. The pro rata share for the property transitioning shall be eliminated. Two acre-feet per acre per year, based upon the acreage being transferred, shall be provided to the M & I provider.

5.3.3.3. When the extraction facility serving the lands transitioning is not located on the land transitioning, the Executive Officer shall determine the allocation on an equitable basis for the remaining properties not transitioning to M & I. Two acre-feet per acre per year, based upon the acreage being transferred, shall be provided to the M & I provider.

5.3.3.4. The transfer shall be effective upon the approval of the Executive Officer, taking into account the ongoing use of the property.

5.3.3.5. Allocation originating from an agricultural extraction facility shall not be transferred to an M & I use except as provided in this Section 5.3.3.

5.3.4. Allocation may be transferred between M & I extraction facilities provided there is no net detriment to the aquifer system. In making this determination, the Executive Officer shall, at a minimum, consider the location of extraction facilities, the aquifer system being used and groundwater quality impacts of the transfer.

5.3.5. Transfer of Allocation - Upon request, the Executive Officer may transfer allocation from one agricultural operator to another agricultural operator or from one M & I operator to another M & I operator provided there is no net detriment to the basins and the transfer is equitable. The transfer of allocation will be of indefinite duration, approved on a "case-by-case" basis, and the Executive Officer shall determine the rate of extraction and the point or points of extraction. Requests for the transfer of allocations shall be submitted jointly by the parties involved and shall include the specific details of their proposal. To ensure that there is no net detriment to the aquifer systems, transfers of allocation shall be subject to other conditions as approved by the Board. Transfers of allocation from Agricultural use to M & I use shall only be approved as provided by Section 5.3.3.

5.3.6. The Executive Officer may approve a temporary assignment of allocation from one operator to another operator when there is no net detriment to the aquifer system. The temporary assignment shall not exceed one year.

5.3.7. Adjustments to M & I Allocations - The Board may adjust the historical allocation of an M & I operator when that operator has supplied groundwater to either an agricultural or M & I user during the historical allocation period and discontinues service to that user. This adjustment may be made by transferring the supplied portion of the historical allocation from the M & I operator to the new user. This adjustment will avoid increased pumping due to windfall allocations that could otherwise result when the M & I operator discontinues service. To avoid retroactive inequities, where an M & I operator has discontinued service to a user prior to July 1, 2005, the amount of the supplied portion of the historical allocation may be allocated to both the M & I operator and the user.

5.3.8. Historical allocation is subject to adjustment as provided in Section 5.4 below.

5.3.9. Procedures for Adjustment

5.3.9.1. It shall be necessary for the operator of the extraction facility to file a verified Application for Adjustment with the Executive Officer.

5.3.9.2. Adjustments of extraction allocations, pursuant to the Applications for Adjustment, shall be considered for approval by the Board after reviewing the findings and recommendations of the Executive Officer and, if approved, shall be effective for the remainder of the calendar year and for all subsequent calendar years until modified by a subsequent Board approved adjustment.

5.4. **Reduction of Extraction Allocations**

5.4.1. Historical extraction allocations, adjusted or otherwise, shall be reduced in order to eliminate overdraft from the aquifer systems within the boundaries of the Agency for agricultural and M & I uses. The reductions shall be as set forth below:

1992 - 1994 extraction allocation = 95% of historical extraction, as adjusted.
1995 - 1999 extraction allocation = 90% of historical extraction, as adjusted.
2000 - 2004 extraction allocation = 85% of historical extraction, as adjusted.
2005 - 2009 extraction allocation = 80% of historical extraction, as adjusted.
After 2009 extraction allocation = 75% of historical extraction, as adjusted.

5.4.2. Following the appropriate public review, the Board may exempt historical extraction allocations from these adjustments on a basin-by-basin basis.

5.5. **Exemptions from Reductions**

5.5.1. The following types of extraction allocations are exempt from the reductions set forth in Section 5.4.1:

5.5.1.1. Baseline Extraction Allocations as set forth in 5.6.1.1.

5.5.1.2. Annual Efficiency Extraction Allocations as set forth in 5.6.1.2.

5.5.1.3. Non-metered Extraction Facilities. Reductions in extraction allocations shall not apply to those extraction facilities as identified in Chapter 3 that do not require flowmeters. Neither retroactive adjustments nor refunds will be made, except that any outstanding surcharges for non-metered extractions that existed prior to June 26, 2002 will be waived.

5.6. **Alternative Extraction Allocations**

5.6.1. As an alternative to historical extractions, the Executive Officer may establish a Baseline or an Annual Efficiency extraction allocation for an operator, as follows:

5.6.1.1. Baseline Extraction Allocations. If no historical extraction exists, or the historical allocation is less than one acre-foot per acre per year, a Baseline extraction allocation may be established by the Executive Officer at one acre-foot per acre per year.

5.6.1.1.1. A Baseline Extraction Allocation specifically applies to undeveloped acreage that is being developed and once approved shall remain with that developed acreage. A Baseline allocation may be combined with a historical allocation for commonly operated facilities in the same basin. A baseline allocation shall not be used with an efficiency allocation.

5.6.1.1.2. To obtain a Baseline Extraction Allocation, a detailed report must be submitted to the Executive Officer. The report shall describe the historical extraction of groundwater use, if any, during the period between the end of calendar year 1984 and the end of calendar year 1989, the type (crop type or M & I) and the amount of water use and acreage involved. The report shall include copies of Assessor's maps identifying the parcels where groundwater is presently being used. For the purpose of this ordinance, one (1) acre-foot per acre per year represents a reasonable use of water for a Baseline extraction allocation.

5.6.1.1.3. Application for the initial Baseline Extraction Allocation must be submitted prior to submission of the annual report of pumping. If approved, the Baseline Extraction Allocation shall apply beginning with the current calendar year.

5.6.1.1.4. To facilitate accounting procedures, an operator shall use Baseline Extraction Allocation before using Historical Allocation.

5.6.1.2. Annual Efficiency Extraction Allocation - If an operator can demonstrate to the Executive Officer that water used for agriculturally developed land is at least 80 percent overall irrigation efficient, based on evapotranspiration requirements, an Annual Efficiency extraction allocation shall be established for one calendar year. An 80 percent overall irrigation efficiency has been determined by the Agency to be reasonable on agricultural lands within the Agency's boundaries.

5.6.1.2.1. An Efficiency Allocation may be used when no historical allocation exists or when the historical allocation is not sufficient for the crop being grown. A historical allocation shall not be used in conjunction with an efficiency allocation.

5.6.1.2.2. To prove that irrigation efficiency is at least 80 percent, the operator must submit a detailed report covering a minimum period of the immediately preceding calendar year. This report shall be submitted to the Executive Officer no later than February 1st of the following year unless otherwise extended by the Board. The report shall include a complete crop and irrigation history for the extraction facility and actual acreage irrigated. The report shall include the reference evapotranspiration (ETo) rates and crop factors (Kc) for the calendar year period similar to that provided by the California Irrigation Management Information System (CIMIS) as developed and modified by the California Department of Water Resources. The report shall include a summary sheet that compares the water use to the evapotranspiration requirements for each crop and the corresponding acreage covered in the calendar year. The Board may extend the time to apply for an efficiency allocation for any year.

5.6.1.2.3. Irrigation efficiency will include an appropriate amount of water necessary to avoid salt build-up based on the quality of irrigation water used.

5.6.1.2.4. Irrigation Efficiency (I.E.) will be calculated using the following formula:

$$I.E. = \frac{[ETo \times Kc] - ER \times 100}{\text{Actual Water Applied (inches)}}$$

Where:

ETo is the reference evapotranspiration measured in inches.

Kc is a crop factor, which is a dimensionless number that relates water use by a given plant in comparison to ETo.

ER is the effective rainfall measured in inches as determined by the Executive Officer.

5.6.2. Exceptions - The Board may grant exceptions to Sections 5.6.1.1 and 5.6.1.2 on a case-by-case basis. However, individual exceptions shall not become the norm. Where agricultural efficiency cannot be measured as set forth in Section 5.6.1.2, then the most efficient practices of record for the type of agricultural use shall be the measurement of efficiency utilized by the Board in its deliberations.

5.7. **Credits**

5.7.1. Credits can be obtained by operators, but are not considered as extraction allocations or adjustments to extraction allocations. Credits are not subject to any reductions as set forth in Section 5.4.1. Credits, if available, shall be used to avoid paying extraction surcharges. Credits shall be accounted for through the normal reporting and accounting procedure and are carried forward from year to year. Except as provided below, credits may be transferred between commonly operated extraction facilities and within the basin where the credits were earned.

5.7.2. The Board may transfer credits between facilities that are not commonly operated within a basin or beyond the basin where such credits were earned, provided that there is no net detriment to the aquifers within the Agency. In determining whether there is no net detriment, the Board may, among other things, consider whether the transfer will help bring the aquifers within the Agency into equilibrium or whether the transfer is a part of an Agency or inter-Agency management plan or program to bring the aquifers of the Agency into balance. Also, in making this determination of no net detriment the Board may consider quality of water as well as the quantity. The transfer of credits will be of indefinite duration, approved on a "case-by-case" basis, and the Executive Officer shall determine the rate of extraction and the point or points of extraction.

5.7.2.1. Requests for the transfer of credits shall be submitted jointly by the parties involved and shall include the specific details of their proposal. To ensure that there is no net detriment to the aquifer systems, transfers of credits shall be subject to other conditions as approved by the Board. Under no circumstances shall credits earned as a result of agricultural use be transferred to an M & I Provider, M & I Operator or an M & I User unless the transfer is specifically approved by the Board and no net detriment to the aquifer systems involved can be shown. Credits earned by an M & I facility shall remain with that facility unless transferred by the Board or transferred as part of a program such as an Agency or inter-Agency management plan or program approved by the Board. The types of credits are:

5.7.2.1.1. Conservation credits - An operator can obtain conservation credits by extracting less groundwater than the historical extraction allocation. Annual Efficiency, Baseline, or an allocation assigned to an extraction facility that is not required to have a flowmeter shall not earn credits. Credits shall be determined by the Executive Officer after receipt of annual extraction data. Subsequent to determining the amount of credits earned, a confirmation shall be mailed to the operator indicating the current allocation, the groundwater extracted during the previous calendar year, and the credits or surcharges for the previous year.

5.7.2.1.2. Storage credits - An operator may obtain storage credits for water that has been determined by the Board to qualify for credits or foreign water stored, injected or spread and percolated or delivered in lieu of pumping in a Board approved injection/storage program used within the Agency Boundary. A written application for approval of a program or an injection/storage facility shall include:

5.7.2.1.2.1. Operator of proposed injection/storage program.

5.7.2.1.2.2. Purpose of proposed injection/storage program.

5.7.2.1.2.3. Location, depth, casing diameter, perforated interval and other information regarding proposed injection/extraction facilities, if applicable.

5.7.2.1.2.4. Method of operation including source, quantity and quality of water, planned scheduling of storage, injection/extraction, delivery or percolation operations and proposed use of extracted water.

5.7.2.1.2.5. Any other information deemed necessary by the Executive Officer.

5.7.3. Following Board approval of the application, successful storage, delivery or injection of water and reporting of results, an operator will obtain credit as determined by the Executive Officer.

5.8. Extraction Surcharges and Late Penalty

5.8.1. Necessity for Surcharges

5.8.1.1. Extraction surcharges are necessary to achieve safe yield from the groundwater basins within the Agency and shall be assessed annually when annual extractions exceed the historical and/or baseline allocation for a given extraction facility or the combined sum of historical allocation and baseline allocation for combined facilities. The extraction surcharge shall be fixed by the Board and shall be based upon (1) the cost to import potable water from the Metropolitan Water District of Southern California, or other equivalent water sources that can or do provide non-native water within the Agency jurisdiction; and (2) the current groundwater conditions within the Agency jurisdiction.

5.8.2. At the discretion of the Board, the extraction surcharge may be structured, tiered, and varied between basins and or aquifers.

5.8.3. The Board shall fix the surcharge by Resolution at a cost sufficiently high to discourage extraction of groundwater in excess of the approved allocation when that extraction will adversely affect achieving safe yield of any basin within the

Agency and may adjust the surcharge by Resolution; provided however, that the then existing extraction surcharge shall remain in effect until adjusted by the Board.

5.8.4. Surcharge for No Allocation - In circumstances where an individual or entity extracts groundwater from a facility(s) having no valid extraction allocation, the extraction surcharge shall be applied to the entire quantity of water extracted. Imposition and acceptance of payment of the surcharge imposed on an individual or entity that extracts water from a facility(s) that holds no extraction allocation shall not be deemed a waiver of the Agency's authority to limit or enjoin the unauthorized extractions.

5.8.5. Efficiency Surcharge Facilities relying on the annual efficiency allocation shall also be subject to surcharge for inefficient use. The extraction allocation for efficiency is the amount of water used at 80% efficiency as defined in 5.6.1.2 of this ordinance. Extraction surcharges will be applied to the difference between the water extracted which correlates with the actual efficiency achieved and the water that would have been extracted to attain the 80% efficiency allocation. For example, an actual efficiency of 70% would be subject to surcharges on the difference between the amount of water used at 70% efficiency and the amount of water that would have been used at 80% efficiency. If an efficiency of less than 60% is achieved, no efficiency allocation will be available, and the operator shall revert to a historical, baseline or to no allocation whichever applies to that facility. Extraction surcharges would then apply to the difference between actual water used and the applicable allocation, if any. For example, a facility operating at an actual efficiency of 59% with no historical or baseline allocation, would be subject to surcharges on all water used.

5.8.6. Payment of Extraction Surcharges

5.8.6.1. Surcharges are assessed annually with respect to the annual allocation and shall become due and payable by the owner/operator on February 1st each year or 30 days after the date shown on the "Semi-Annual Groundwater Extraction Statement." Payments shall be made with credits, if available. The Board may extend the 30-day time allowed to pay surcharges for a period of up to twelve months when circumstances exist that in the opinion of the Board warrant such extension. The Board may also approve the payment of surcharges in installments of up to 24 months with terms suitable to the Board.

5.8.6.2. Late Penalty - The operator shall pay a late penalty for any extraction surcharge not satisfied by the due and payable date. The late penalty shall be 1.5 percent per month, or any portion thereof, of the amount of the unsatisfied extraction surcharge. The late penalty shall not exceed 100% of the original surcharge, provided the penalty is paid within 60 days of billing. If the fee is not paid within the 60 days, the penalty will continue to accrue at 1.5 percent per month with a final maximum of 200% of the original penalty due.

5.8.6.3. Collection of Delinquent Extraction Surcharges and Late Penalties - The Board may order that any given extraction surcharge and/or late penalty shall be a personal obligation of the operator or shall be an assessment against the property on which the extraction facility is located. Such assessment constitutes a lien upon the property, which lien attaches upon recordation in the office of the County Recorder. The assessment may be collected at the same time and in the same manner as ordinary ad valorem taxes are collected, and shall be subject to the same penalties and the same procedure and sale, in case of delinquency as provided for such taxes. All laws applicable to the levy, collection and enforcement of ad valorem taxes shall be applicable to such assessment, except that if any real property to which such lien would attach has been transferred or conveyed to a bona fide purchaser for value, or if a lien of a bona fide encumbrance for value has been created and attaches thereon, prior to the date on which the first installment of such taxes would become delinquent, then the lien which would otherwise be imposed by this section shall not attach to such real property and an assessment relating to such property shall be transferred to the unsecured roll for collection.

5.8.6.4. Use of Extraction Surcharges and Late Penalties - Revenues generated from extraction surcharges and late penalties shall be used exclusively for authorized Agency purposes, including financial assistance to support Board approved water supply, conservation, monitoring programs and water reclamation projects that demonstrate significant reductions in overdraft.

CHAPTER 6.0
Appeals

6.1. Any person aggrieved by a decision or determination made by the Executive Officer may appeal to the Board within forty-five (45) calendar days thereof by filing with the Clerk, or Deputy Clerk, of the Board a written request that the Board review the decision of the Executive Officer. The Board shall equitably act on the appeal within 120 days after all relevant information has been provided by the appellant.

CHAPTER 7.0
Severability

7.1. If any section, part, clause or phrase in this Ordinance Code is for any reason held invalid or unconstitutional, the remaining portion of this Ordinance Code shall not be affected but shall remain in full force and effect.

CHAPTER 8.0
Penalties

8.1. Any operator or other person who violates the provisions of this Ordinance Code is subject to the criminal and civil sanctions set forth in the Agency's enabling act and its Ordinances.

8.2. Any person who intentionally violates any provision of this Ordinance Code shall be guilty of an infraction and may be required to pay a fine to the Agency in an amount not to exceed five hundred dollars ($500).

8.3. Any person who negligently or intentionally violates any provision of this Ordinance Code may also be liable civilly to the Agency for a sum not to exceed one thousand dollars ($1,000) per day for each day of such violation, in addition to any other penalties that may be prescribed by law.

8.4. Upon the failure of any person to comply with any provision of this Ordinance Code, the Agency may petition the Superior Court for a temporary restraining order, preliminary or permanent injunction, or such other equitable relief as may be appropriate. The right to petition for injunctive relief is an additional right to those, which may be provided elsewhere in this Ordinance Code or otherwise allowed by law. The Agency may petition the Superior Court of the County to recover any sums due the Agency.

This Ordinance Code and amendments hereof shall become effective on the thirty-first day after adoption.